Farm-School Collaboration and the underlying motivation, values and learning goals – Enhancing childrens' academic learning and fostering food citizenship?

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Content:

Overall programme

Sunday 1 July: Venue Musikhuset, Thomas Jensens Allé, 8000 Aarhus

14:00	Registration open
14:45 – 15:10	Welcome to IFSA Symposium and Aarhus University
15:10 – 15:30	Launching of book:
	"The farming systems approach into 21st century: The new dynamics"
15:30 – 16:45	World Café
16:45 – 17:45	Reception and welcome to the City of Aarhus

Monday 2 July: Venue Building 1531 and 1532, Ny Munkegade 118, 8000 Aarhus

8:00	Conference office and helpdesk opening
8:30 – 10:00	Opening plenar session:
	"Producing and reproducing Farming Systems"
10:00 – 10:30	Coffee break
10:30 – 12:00	Workshop sessions
12:00 – 13:30	Lunch
13:30 – 15:00	Workshop sessions
15:00 – 15:30	Coffee break
15:30 – 17:00	Workshop sessions
17:15 – 18:00	Business meeting
19:00 – 24:00	10th Anniversary Conference Dinner and Party
	Venue: Stakladen, Frederik Nielsens Vej 2, Building 1423

Tuesday 3 July:

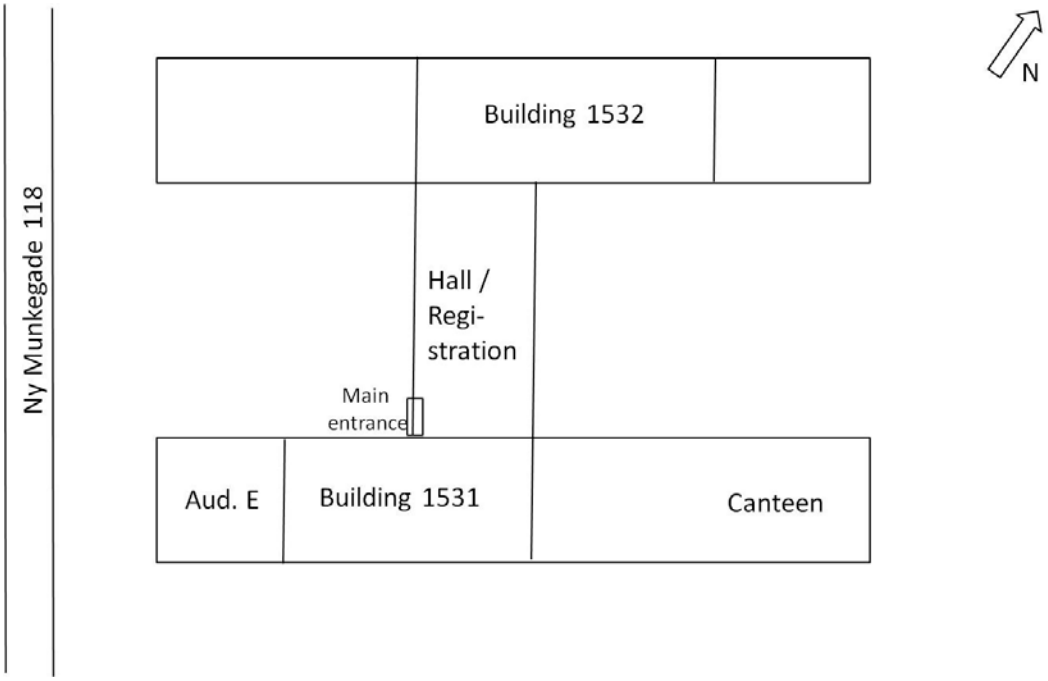
9:00 – 18:00	Field trips

Wednesday 4 July: Venue Building 1531 and 1532, Ny Munkegade 118, 8000 Aarhus

8:30 – 10:00	Workshop sessions
10:00 – 10:30	Coffee break
10:30 – 12:00	Workshop sessions
12:00 – 13:30	Lunch
13:30 – 15:00	Workshop sessions
15:00 – 15:30	Coffee break
15:30 – 16:30	Plenary closing session:
	"*Drawing"* the future of farming systems

Conference venue

The conference takes place in building 1531 and building 1532, Department of Mathematics, Ny Munkegade 118, 8000 Aarhus C.



Building 1531:

- ground floor
  - Room no D-113
  - Room no D-119
- second floor
  - Room no D-211
  - Room no D-215
  - Room no D-219

Building 1532:

- ground floor
  - Room no G-116
  - Room no G-122
- second floor
  - Room no G-214
  - Room no G-218
  - Room no G-222

The dinner Monday 2 July will take place in STAKLADEN, building 1423, located at Frederik Nielsens Vej 2, 8000 Aarhus.

Overview workshop locations

Monday 2 July:

Room / Session	10:30 – 12:00	13:30 – 15:00	15:30 – 17:00
D 215	WS 1.1	WS 1.1	WS 1.1
D 211	WS 1.2	WS 1.2	WS 1.2
D 113	WS 1.3	WS 1.3	WS 1.3
D 119	WS 2.2	WS 2.3	WS 2.3
D 219	WS 3.1	WS 3.1	WS 3.1
G 218	WS 3.2	WS 3.2	
G 122	WS 4.2	WS 4.1	WS 4.1
G 222	WS 6.4	WS 6.4	WS 6.4
G 214	WS 6.1	WS 6.1	WS 6.1
G 116	WS 6.3	WS 6.3	WS 6.3
G 322		WS 5.3	WS 5.3

Wednesday 4 July:

Room / Session	8:30 – 10:00	10:30 – 12:00	13:30 – 15:00
D 215	WS 1.1	WS 6.2	WS 6.2
D 211	WS 1.2	WS 1.2	WS 1.2
D 113	WS 1.3	WS 1.3	WS 1.3
D 119	WS 2.3	WS 2.3	WS 2.3
D 219	WS 3.1	WS 5.2	WS 5.2
G 218	WS 3.3	WS 3.3	WS 3.3
G 122	WS 4.1	WS 4.1	WS 4.1
G 222	WS 5.1	WS 5.1	WS 5.1
G 214	WS 6.1	WS 6.1	WS 6.1
G 116	WS 6.3	WS 6.3	
G 322		WS 5.3	

Solving the Problems of Sustainability and Food Security: exploring the new 'disorder' and its scientific and spatial responses

Keynote speaker:
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Historically under advanced capitalist agri-food development national and international government bodies and their associated regulatory agencies have always had to manage the twin problems of sustainability and security of food supply. In the post-war period explicit food security policy and nationally-based state-led productivism was the main vehicle. More recently, in the latter decades of the 20th century and the first decade of the 21st these problems were assuaged through variable forms of 'post-productivist' environmental regulation on the one hand, and the unleashing of an intensive neo-liberal , public-private retailer-led system of food regulation on the other. These regimes created a distinct form of uneven and unequal development whereby much of the advanced world (and its mass consumers) were protected from the growing environmental risks and vulnerabilities experienced in the developing world. Both parellel regulatory systems (and their dominant scientific paradigms) managed these twin conundrums for some significant time; but they have not solved the distinctive sustainability and security problems in the long term, and it could be argued that they have only exacerbated these problems at the global level.

We are now witnessing a new period of 'disorder' in which both the (increasingly interdependent) global and regional problems of sustainability (both in terms of composite and interdependent resource depletion collides with climate change effects), and severe problems of food security are to the fore. These problems can no longer be contained either within national borders or inside the ever more sophisticated privately organised supply chains.

I wish to assess this new period of disorder by examining the role of the scientific and spatial responses to it with regard to the development of bio-economic and eco-economic paradigms and the ways in which a more critical sustainability science can contribute to both understanding this dis-order; and in finding more effective solutions to it in different spatial contexts. This holds implications for the research agenda of rural and environmental sociology in that it creates a new basis for both critical and normative approaches to sustainable place-making and new conceptual developments which are stimulated by the plethora of research so far conducted on alternative food networks. In particular the paper will address the uneven growth of the place-based eco-economy, part of which is stimulating new types of urban and rural interactions and new clusters of economic activity in different forms and expressions. Key questions remain, however, in how such developments can be scaled up, or scaled out in ways which lead to mainstream and durable shifts in agrarian and rural systems. Finding answers to these temporal and spatial questions forms a key dimension of a real agri-food sustainability paradigm which lies before us.

Achieving Sustainability via Eco-labels? Examining the social and ecological dynamics of the 'Food from Somewhere' Regime

Keynote speaker:
Professor Hugh Campbell
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In this address I want to examine the rather contentious and potentially challenging 'middle zone' of activity in global food relations that has opened up around what I term the 'Food from Somewhere' regime. Around 20 years ago, at the conclusion of the GATT Uruguay Round of global trade negotiations (and subsequent formation of the WTO) a great deal of attention was given by scholars to the implications of the establishment of a neoliberal world order for food. Scholars like Philip McMichael suggested, at that time, that the world was now about to be progressively absorbed into a Corporate Industrial Food Regime, supported by neoliberal governance systems, operated by trans-national corporate capital and trading in industrial, mass-produced and highly substitutable commodities. He termed this new regime: 'Food from Nowhere'. In opposition to this emerging regime in world food relationships, some agri-food scholars pointed to the need to encourage and recognize local food systems, local food cultures, new social movements around local food, farmers markets, urban gardening and other initiatives that might help form some kind of sustainable locally-embedded alternative to Food from Nowhere. At the time, many of us were comfortable with the assumption that world food politics was configured around two poles – the globalizing, industrial, corporate (capitalist?) pole represented by McMichael's Food from Nowhere, and the local, embedded, more sustainable pole of local foods.

My own scholarly path has taken me into the uncomfortable 'middle zone' in between those two poles. One of the curious dynamics of the last 15 years has been the rise of globally-traded foods that make sustainability claims. Commencing with certified organic, the global trade in organic foods has often involved large farms, large corporations (both in agriculture and in retailing), highly professionalized auditing organisations and has captured increasingly large segments of high value markets in wealthy countries. The food that is traded within this middle zone is positioned to sell for higher prices due to its overt quality claims that derive from measures of sustainability, eco-friendliness, the appropriateness of social conditions of production (like Fair Trade), or having been derived from a desirable location in the world. I have termed this 'Food from Somewhere' to distinguish it from its alternative - Food from Nowhere. Food from Somewhere might come from somewhere but it arguably has quite different dynamics and qualities to local foods. It is globally traded, through highly evolved food retailing systems and supported by large export corporations, highly successful retail chains and professional audit organisations. The existence of the Food from Somewhere regime is highly challenging to those of us who held onto a comfortable binary separation of the world food system into that traded in the globalized corporate industrial world of food (most definitely NOT sustainable) and that which operates in local, more socially and culturally embedded food relationships (which we assumed would be MORE sustainable). Where do Foods from Somewhere fit in our understanding of sustainable food systems? Are they 'tick box' schemes that allow producers to claim environmental benefits while maintaining conventional production practices? Are they a shallow exercise in corporate 'greenwashing'? Or do they actually have transformative potential to change the economic, environmental and social character of farming? These questions lurk behind the eco-labels that we are faced with when we shop at Sainsburys or Natural Foods stores.

To start to answer these questions, I will consider the transformation of food production in New Zealand. Some agri-export industries in New Zealand have become enthusiastic participants in the Food from Somewhere Regime, establishing new measures of quality like certified organic, GLOBAL G.A.P. or other industry-specific eco-labelling schemes. In the last 15 years, food export industries in New Zealand have made a significant transition from almost total absence of any eco-labelling or

measures relating to claims of environmental qualities or sustainability to a situation where there is now near mandatory requirement for compliance in some export industries (particularly kiwifruit, apples, wine and fine wool), and the establishment of eco-label or environmental QA schemes that are now incorporating increasingly larger segments of meat production. All of these schemes deploy some kind of quality measures and audit of production practices that make claims on enhanced environmental qualities or sustainability. This ranges from the kiwifruit industry where the Zespri label makes strong environmental quality claims to new quality measures in the meat industry which include some aspects of environmental health and animal welfare within a wider suite of quality measures in order to gain access to Japanese, European or US retailers. Through this rapid transition into market-driven eco-labels and measures of sustainability, New Zealand has become an early participant in trading of Foods from Somewhere. Key industries became strong participants in the elaboration and embedding of global audit systems like GLOBAL G.A.P. and spearheaded the early phases of establishing a global market for certified organic foods. New Zealand therefore forms an excellent site for evaluating exactly what are the consequences and outcomes of taking the eco-label pathway to sustainability.

The ARGOS project was established in New Zealand in 2003 and has been running continuously since then. It is a longitudinal study of 100+ farms and orchards in the Sheep/Beef, Dairy and Kiwifruit sectors and examines the effects of taking the market audit pathway to sustainability. The project has deployed a transdisciplinary approach and sought to understand the relative outcomes of organic, conventional and Integrated Management approaches to farming on (mainly) family farms in New Zealand's food export sector. After nine years of research, the ARGOS project has started to publish its first findings on the social, environmental and economic outcomes of choosing to produce according to the audit criteria of an eco-label (usually certified organic or GLOBAL G.A.P.) or remain outside the new labeling regimes and remain part of the wider group of 'conventional' farmers. The preliminary results reviewed in this Address suggest that eco-labels do translate into demarcating different bodies of social practice and environmental outcomes on farms and orchards. However, these vary greatly and the outcomes are not particularly strong – except in a few dimensions of farming systems. A number of important questions arise from this first set of results. In particular, how do we 'tune' international sets of standards to local ecological conditions and how might the rather 'metric-centric' dynamics of international audit systems enable incorporation of non-measurable, but essential, dynamics of sustainability. The outcomes of the ARGOS project suggest that the Food from Somewhere Regime is opening up space for some challenging new dynamics. While not entirely 'greenwashing' via eco-labels, Food from Somewhere seems to be only enabling reasonably modest opportunities for transforming agricultural practice.

Convenors:
Laurens Klerkx and Pierre Labarthe

The role of advisory services in bridging science and farmers' practices seems crucial in a context of diversification of challenges faced by agriculture regarding public goods issues; together with an exponential growth of academic publications related to these various challenges. The risk of an increasing gap between science and advisory practices at field level is often stressed by various stakeholders at both sides. We propose to discuss about how different institutional configurations of Agricultural Knowledge Systems tackle (or not) this challenge in various countries.

Beyond fragmentation and disconnect: networks for knowledge sharing in the English land management advisory system

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The growing multifunctionality in agriculture, combined with privatisation of previously state-funded agricultural extension services, has resulted in a pluralistic land management advisory system. Despite benefits in terms of increased client orientation and greater advisor diversity, it is argued that these changes have resulted in the fragmentation of the land management advisory system and a reduction of interaction within the advisory system and between the advisory system and science. Hence, concerns have been voiced as regards the capacity of the advisory system to be able to incorporate new knowledge and skills to offer adequate advisory services, resulting in a growing interest in how advisors obtain and construct the knowledge and skills necessary for offering adequate advisory services to their clients. In this paper we explore how advisors (land agents, applied ecologists and veterinarians) develop their knowledge and skills by engaging in different kinds of networks. Key findings suggest that advisors draw upon informal 'communities of practice' within their own advisory profession, but also draw upon broader 'networks of practice' involving multiple advisors from different advisory professions, resulting in knowledge sharing, brokered around the complex queries of clients. Whereas fragmentation and disconnect due to competition and epistemological differences do play a role; they do not appear to prevent overall knowledge sharing among advisors within and across different professions. Assumptions of a collapse of interaction within the land management advisory system are not supported by the evidence. However, to optimize interactions between professions, and between advisors and the science systems, informal or formal brokers in the form of professional associations or other organizations could play a bigger role.

Privatization of extension services: which consequences for the quality of the evidence produced for the farmers?

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This paper aims at better understanding the consequences of the privatization of extension services on the quality of the knowledge produced for and with the farmers. The originality of the study is that it does not focus on the front-office dimension of the services (the direct interactions between farmers and advisers), but rather on the back-office one (R&D investments in field and experimental trials, scientific watch, training, etc.). In that respect, we combined two analytical frameworks: i) the advances of service economics, which allow to better understand the strategies of private firms of extension services; ii) the debates derived from evidence-based policy approaches in public decision,

which make it possible to assess the different types and levels of evidence that support the content of the advice.

The analysis is based on field investigations in France (Ain), Germany (Brandenburg) and the Netherlands (Zeeland). It consisted in qualitative interviews (n=16 firms) with the managers of three types of service suppliers to farmers specialized in arable farming: private consultancy cabinets, input suppliers, and software suppliers.

We could identify three logics of performance: "a service" logic associated with private consultancy cabinets, an "industrial" logic characterizing software suppliers, and a logic of segmentation implemented by input suppliers. A more specific inquiry related to knowledge about food safety showed the consequences of these logics beyond individual concerns of farmers. It demonstrates that the withdrawal of the state from the funding and management of extension may lower the level of evidence produced for the farmers, by substituting expertise to controlled trials and observations, and by giving a more and more important role to private investments related to upstream industries.

Reflections on the 'expert syndrome': a Greek case study on extension education

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Changes pertaining the agricultural knowledge infrastructure, innovation theory and practice as well as the knowledge demand and supply side point to the current, challenging scene for agricultural/rural extension and education. Therefore, new concepts/approaches emerge building on networks, as social processes encouraging the sharing of knowledge and notably as preconditions for innovation; moreover, growing attention is given to various types of intermediaries or (process) facilitators.

On the other hand, knowledge, skills and aptitudes explain the differential production outcomes between business people occupying identical resources (capital, labour and land). Farm businesses with better educated farm managers attain superior outcomes; education and training have been shown to improve farmers' ability to make successful changes to farming practices, including farm-management practices, and assist farmers to become more innovative and flexible.

The current paper explores the issue of extension education through research carried out in a Greek rural area. The target-group comprises participants in the 'Young Farmers Programme', a programme established by the European Union and the Greek state since the early '90s, providing economic incentives to young men and women (up to 40 years old) who enter or are newly established in farming. A requirement of the programme is the training of Young Farmers for at least 150 hours within three years after their access to the programme. These short-term training schemes, provided by the Greek Extension Service, are the entry point of this paper.

Young Farmers' (YFs) attitudes towards and relationships with agronomists, with the latter beeing involved in either training or advice provision, are thus explored. To refine such an exploration different groups of YFs (those at plain areas vs. those at mountainous ones and thus of the respactive production systems) and agronomists (public vs commercial advisors) are distinguished.

Conventional services for organic farmers? Attitudes of organic and conventional producers towards extension education

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Notwithstanding the substantial development of organic farming in Greece, little is known about organic farmers' relationships with extension education services. The main objective of this paper is to shed new light on such links by examining organic producers' satisfaction from extension services and their willingness to participate in agricultural education programs. Data were drawn from a study in Northern Greece. After a random sampling procedure, two groups of farmers (130 conventional producers and 128 organic growers) participated in the study. Descriptive statistics and binary analysis were employed in order to provide a basic overview of the data. In addition, two models of Complementary log-log regression analyses - one for each group of farmers - were created in order to depict the predictors that significantly contribute to farmers' willingness to participate in agricultural education activities. The results indicate that organic farmers are not satisfied with advisory work; such dissatisfaction is illustrated in their low frequency of communication with extension providers, especially those of public or cooperative sector. The above mentioned gap, on the one hand, urges organic farmers to seek information from other members of the rural community and, on the other hand, motivates them to search for knowledge through their participation in agricultural education programs. This finding is reinforced by the higher organic farmers' willingness to participate in agricultural education programs as compared to that of their conventional counterparts. As the Complementary log-log regression model revealed, this willingness is explained by farmers' need to learn about soil management, marketing issues and sustainable practices. Conclusively, the results lend general support to the argument that extension services in Greece remain "traditional-conventional oriented", having failed to establish ongoing relationships with organic farmers.

The impact of agricultural extension services: an empirical test through AKAP models

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The functional repositioning of agriculture redefines the role of the farm, by introducing new possibilities of production and by fostering multifunctional activities.

In this context, a new role for agricultural extension services emerges, aiming at sustaining new frontiers and new perspectives of farm development either in a sectorial or a territorial path.

The supply of extension is represented by a complex system of individual and collective services, the access to which is not always easy. The aim of our paper is to analyze the capability and the difficulties Italian farms encounter to get access to agricultural extension services. Starting point of our paper is that the process of knowledge transfer/adoption is not linear and not always it brings to the adoption of innovation. Many constraints could impede a full exploitation of agricultural extension services. Then, the efficacy of agricultural extension in transferring information and innovation is not immediate: Evenson (1997) describes it as a sequence of phases through which farmer becomes aware and adopts the innovation. Impact of agricultural extension is then described through the AKAP sequence:

A: Farmer awareness
K: Farmer knowledge, through testing and experimenting
A: Farmer adoption of technology or practices
P: Changes in farmers' productivity.

The aim of our paper is to apply the AKAP model toevaluate the impact of agricultural extension services on the Italian farms.To test the model, a questionnaire to a sample of Italian farms will be proposed: a set of questions is provided concerning each phase of the sequence. Differences in every step of the chain are expected, that we intend to connect with possible explicative variables, like farm socioeconomic characteristics and typology of territories involved. Besides, further information may originate from an in-depth analysis of the motivation for not consume agricultural extension services on behalf of farmers. The information so collected will be basis for final consideration and for defining possible future lines of actions under a normative perspective.

Farmers' trainers of Gourcy (Burkina Faso) facing the challenge of adapting their services

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In Burkina Faso, the farmer to farmer extension approach (FTF) is emerging as an alternative for the improvement of agricultural advisory services in a context marked by the need to better take into account the diversity and transformation of farmers needs for support.

The objective of this research was to assess the capacity of farmer's trainers (FT) to adapt their interventions to their clients' needs. Profile and service offer of 27 FT in the district of Gourcy (Burkina Faso) were characterized. Surveys were conducted to 70 producers on their assessment on the support they received from FT.

FT are major producers, illiterate and with a good social status. Their service offer consists in the training of other farmers on techniques of water and soil conservation, post harvests, production of organic manure and agroforestry. These topics are rarely determined by beneficiaries of FT services, but rather by support organizations (SO) including research, NGOs and development projects who bring technical and financial backstopping to FT. SO consider FT as a means of rapid dissemination of innovations, they don't yet see FT as a channel to capture farmer's demands. Producers appreciate positively services delivered by FT, but they also underline the poor capacity of FT to respond to their requests for new themes. FT are facing difficulty to adapt themselves their service offer because of their wait-and-see attitude, their low level of education, the unilateralism of their relations with SO and the unwillingness of their customers to pay for the services they seek.

The FTF can contribute to make up the shortage of public advisory services only if SO and the State better recognize its potential and find means to facilitate capacity building and wider access of FT to knowledge. This raises the issue of the profile, status and integration of FT in a pluralistic advisory framework.

How the French cooperative Terrena identifies, tests and shares the EIF solutions with its members

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Terrena (www.terrena.fr) is one of the major agricultural cooperatives in France, with 22000 farmers members, small as well as big farms. Approximately 300 technicians (crop and animal productions) give advice to the farmers. Besides, the cooperative is highly involved in the food industry (flour, cattle, pigs, poultry, milk, wine…). Thus, the Advisory Board has shown for a long time interest in the expectations of society towards farming, in particular the reduction of the use of non- renewable inputs.

So, in 2008, Terrena decided to focus its strategy on the Ecologically Intensive Farming (EIF), aiming at "producing more and better with less inputs". However, it seemed that the alternative solutions of agrochemicals and the enhancement of ecosystem services put back the farmers in the process of innovation : some innovations come from farmers themselves (bottom-up knowledge). they must be identified in our member farms, tested and validated in our Agronomic Department and then shared with our 22000 members. This leads to a change in the job of the advisors of the cooperative, who were used to bring technical solutions which succeed everywhere and everytime.

To make a success of this change, Terrena has set up a R&D team which, among other objectives, aims at supporting, not only its farmers members, but also its advisors trying EIF solutions. Terrena has also gathered farmers leaders together to build a network of sentinels who are able to innovate, test and popularize innovations. For the last 4 years, Terrena has enjoyed real successes, but also recognises that sometimes some advances came slower than expected.

In 2012, international year of the cooperatives, Terrena would be interested in sharing its experiment with other farmer organisations and research centers in order to improve its own strategy and thus take part in building the WAW.

Which advisory system to enhance innovation in conservation agriculture? The case of Aloatra lake in Madagascar

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The area of Lake Aloatra faces a growing population, a stagnation of rice production and an increase in crop land which are less fertile and subject to erosion. To promote sustainable agriculture research and development projects promote new agricultural techniques based on conservation agriculture including no-tillage practices. Increase in cultivated area affected by these new techniques is real but modest. Questions are raised about the adequacy of support provided to farmers, especially by advisory services.

The objective of this paper is to question the adequacy of advisory services regarding to the organizational and technical changes induced by the adoption of conservation agriculture and to propose improvements of the advisory system regarding to the local constraints and opportunities (skills and creation of knowledge for advisors, funding, interactions between researchers and advisors, etc..)

The work is based on surveys of farmers and stakeholders involved in advisory activities. The results show the dominance of technical advice provided by a project mainly dedicated to the promotion of conservation agriculture and based on the recommendations of a bio-physic research, but also the recent willingness to promote advice that addresses the complexity of farming system in interaction with the proposed technical changes. The results question the advisory method mobilized to achieve the goals but also the capacity of advisors to develop co-constructed advice. They also show the dominance of advisory providers and projects to orient the advisory activities, the role of research in the provision of technical-economic references for advisors and in the development of advisory methods, and the small ability of farmers to influence the choice that are made. They question the sustainability of the advisory system in a context of funding of advisory system by foreign aid.

Advisory Devices Features Farmer's Capacity for Innovation and Lock-in

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Agroecology theoreticians argue that agroecology cannot be transferred like technology but requires alternative extension practices through participatory networks (Warner 2008). Promotion of conservation agriculture in France stands on the same position criticizing scientist laboratory methods and extension services expertise. In a context of privatization of extension services, agrobusiness firms play a major role in the extension of conservation agriculture (Labarthe 2006, Goulet 2008).

This communication addresses the following research questions: i) What are private bodies' extension strategies for agroecological practices and what are the techniques extended under the label "conservation agriculture"? ii) How does an advisory device feature farmers' innovation capacity and the flexibility of their technical systems?

Our research is based on a field work within a French cooperative which defines its business plan in terms of sustainable development and "ecological intensification." Conservation agriculture is a textbook example of the approach. In this cooperative of eastern France, two advisors, both equally eager to promote conservation agriculture, are using contrasted methods: one provides instructions on conservation agriculture while the other organizes a network of participatory social learning.
The results obtained are as follows:

- Advisory devices are contrasted
- Conservation agriculture leads to a range of prescriptions and agronomical practices
- Innovation processes, dependences and lock-in:

In the first case, farmer's capacity for innovation is built on the advisor taking on the management of risks. Only one agronomic system and one way to achieve it, is thus possible. In the club, farmer's capacity for innovation is built on the availability of a wide range of means to solve problems and thus allows a diversity of agronomic systems and innovation paths. Expectations for GMOs are much greater in the first case than within the club.

The advisors' view on the privatized extension system in the federal state of Brandenburg, Germany

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In the federal state of Brandenburg, Germany, provision of agricultural extension has been privatised in the early nineties. Since then, public financial support was reduced continuously until full deletion in 2001. In 1996, a first empirical evaluation of Brandenburg's extension system (Bokelmann et al. 1996) had been undertaken revealing the view of the advisors and farmers on the privatized system at that time. Since 2006, several empirical studies were carried out, that explore specific segments of the Brandenburg agricultural knowledge system, some focussing explicitly on the view of farm advisors. The paper presents selected results that characterise the advisors' perspective from those studies in 2006 (Knuth 2008) and 2010 (Knierim et al. 2011).

The privatisation process resulted in concentration and diminution of advisory services and cooperation between advisory companies was clearly reduced:
Contentwise advisory services in Brandenburg tend to concentrate on economic topics, especially investment planning often combined with subsidy questions. Cross Compliance topics are seldomly discussed explicitly but combined with other interests of the farmer. Farm Management Systems (FMS) as a main instrument for CC advice in Germany are sparsely used in Brandenburg, as the development of FMS and the supply of CC advice were not co-funded by the state unlike in other

German states. Compared to the situation in 1996 the intensity of advisory services to the single farmer is reduced through increased number of farmers per advisor and increasing distances to travel.

In 2006 most advisors evaluated the full deletion of public financial support by the government mainly positive. Nevertheless resulting problems from privatisation such as negligence of environmental topics or small farms are perceived by the advisors.

Both studies reveal a fairly low satisfaction of the advisors with the provision of information and support especially offered by state authorities.

Institutionalization of knowledge sharing platforms in the last three decades in Francophone Sub Saharan Africa

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This paper analyzes the processes of institutionalization of agricultural knowledge sharing platforms among stakeholders in the last three decades in Francophone Sub Saharan Africa relying on Benin case study. The paper is based on literature review and semi-structured interviews with various stakeholders according to an historical and institutional perspective. In the 1980s, Monthly Workshops for Technology Review which brought together extension workers and research were the main institutional framework created to implement national research-development policy. These platforms were too expensive to be sustainable and lacked participation of stakeholders. During the 1990s, National, Departmental and District Agricultural Extension/Research Systems/Committees including agricultural development stakeholders were set up to promote participatory technology development. Regional and Sector Committees for Research- Development giving a voice to technology users were established in the 2000s to link researchers, extension workers and end users of technology including farmers and the private sector. These multilevel platforms lacked effective coordination mechanisms. These multilevel and multi-stakeholders knowledge sharing platforms, quite similar in Francophone Sub Saharan African countries, functioned just as long as financially supported by donors. Therefore, operational designs for technology sharing shifted from heavy, expensive and ineffective machine (all stakeholders' consultative platforms) to more specific and pragmatic research and training contract arrangements between research organizations and development workers in the last three decades. Nevertheless, these changes weakened national, regional and district levels coordination mechanisms.

Public – Private policy Change and its Influence on the Linkage of Agricultural Research, Extension and Farmers in Iran

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The collaboration of agricultural research, extension and farmers is essential for an effective agricultural innovation system. This paper is to show the linkage of Iranian agricultural research centres with extension and farmers using three case studies in 1999, 2005 and 2010. The data were collected through a document analysis, structured and unstructured interviews and observations. The 1999 and 2005's cases was conducted in the context of public extension system. In this period, both extension services and research centres were public and were under one organization or separate organizations managed by the Ministry of Agriculture. Some mechanisms were defined for linking extension to research, for example providing incentives to researchers to define their research based on farmers' needs, joint publications, joint on-farm research and joint meetings. Despite these regulations, due to poor management, most researchers had a disciplinary orientation and had a poor relationship

with farmers and extensionists. They tended to have a negative attitude towards farmer-oriented participatory research approaches. In the mid 2000s, government ratified a legislation to privatize extension system, especially based on a contractual agricultural extension service delivery. The 2010's case revealed that agricultural researchers had little connection with private agricultural service companies, who were in charge of agricultural innovation delivery. No mechanism has been defined for linking research centres to the private sector. The researchers have been encouraged to focus on the research problems which were mostly based on academic incentives such as international and national academic journal publications rather than farmers' needs. The privatization has led to a poorer linkage of research with extension systems and farmers.

Learning aspects by the Danish System for a Brandenburg NE German concept

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Manifold framework conditions and structural changes have formed the present Agricultural Knowledge System - AKS in the post-socialist German Federal State of Brandenburg. Organisational and institutional structures have been in transition since 1990, compelled to search for new functions and roles in the free market system. After 20 years there is no formal solution visible yet, reconsidering public goods issues, except requirements and planning hierarchies, which had to be installed for new in the 90th in all New Federal States of Germany. The official solutions chosen in Europe according sustainability approaches in agriculture and rural areas are diverse in the sense of privatisation level of advisory services and structure of extension education. The Brandenburg case fits the category "private finance – private delivery" (Rivera 2001), while the Brandenburg education system still has more elements under public support.

Learning aspects from the Danish Example, mainly the last years´ structural changes, are chosen to help answering open questions of the Brandenburg cases (1990 in process - 2002 fully privatised agricultural extension system) towards an innovative extension and education system including environmental aspects and informal strategies.

The table 1 in Heiden (2006, p. 371) gives an overview of criteria chosen as important for international AKS estimation searching for rural development options in Agricultural Knowledge Systems:

A) Criteria taken for description and identification of characteristics
B) Estimation and Chances of Success for Agricultural Knowledge and Information Systems for Rural Development - AKIS/RD.

Expert interviews with stakeholders who took or still take an active part on the changing processes will be brought into the debate about the respectively other system. Comparabilities and differences of the Danish and Brandenburg systems will be derived and from the authors´ prospective most important linkages and aspects on these will be fundamentally described, e.g. networking and knowledge centre activities like the Danish Agro Food Park.

The development of crop and soil management options for enhanced soil organic carbon sequestration: the science-advice interface

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Farming practices that lead to declining returns and inputs of carbon (C) to soils pose a threat to soil functions by reducing availability of organic matter for soil microbes and by affecting soil structure, and soil carbon stocks that are key to regulating greenhouse gas emissions. Sustainable farm Management Aimed at Reducing Threats to SOILs under climate change (SmartSOIL), a four year FP7 research project which started in November 2011, aims to model data from long term experiments to develop soil and crop management options for improved productivity and enhanced soil organic carbon sequestration. Consultation with key stakeholders within the advisory community in case study regions is an integral part of this project where the aim is both to understand socio-economic barriers to proposed soil management practices, and to develop a decision support tool (DST) and guidelines for advisors to use. This presentation will report on the preliminary consultation with the advisory community in six case study regions. In particular it will explore knowledge processes at the interface between science and advice, where the science is highly specialised and complex. It will examine advisors' ability and willingness to use evidence based DST and guidelines as a basis for their advice to farmers.

The unique role of public farm advisers in agriculture extension networks

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Privatisation of extension services internationally has been motivated by a need for greater efficiency and effectiveness. However experience with privatisation has also highlighted risks that occur at a range of scales. At an individual scale there is the risk that some farmers will be unable to pay for private consulting services. At individual and industry scales there may be reduced tolerance to fund public good issues unless benefits are explicit. In addition there are industry and network risks that knowledge sharing will become less open and that access to innovation and technical knowledge will become more constrained as farmers and other stakeholders protect private good benefits of innovation more vigorously. These represent various dimensions of market failure however there is a further, less obvious risk that is more difficult to measure – the loss of network connectivity when experienced, trusted public advisers leave extension networks.

Australia is one of few nations that retain a public agriculture extension service however there is increasing pressure to withdraw this in favour of private extension. While there is still opportunity, both the risks and benefits of privatisation need to be understood by policy makers and other stakeholders within agriculture networks to ensure that extension resources are appropriately recognised and maintained. Specifically this paper considers the contribution of public advisers for maintaining network connectivity through their unique knowledge brokering roles, particularly when compared to private advisers. The empirical evidence presented is based on findings from a RD&E case study, Project 3030, in which public and private advisers, along with researchers and farmers, all participated in a knowledge network whose purpose was to increase farm profitability by 30% by increasing home grown forage by 30%. Through the use of participant observation, semi-structured interviews and social network analysis, broker styles of public and private advisers were compared. Public advisers contributed significantly to bridging and boundary spanning capability as they focused on building relational links that would enable knowledge sharing between the diverse transdisciplinary participants of the network. Private advisers on the other hand, developed strong bonding social capital

between themselves and with the farmers groups they were closely associated with but had limited connections with other network participants. Data was analysed using social capital theory to identify and explain the bonding, bridging and boundary spanning forms of brokering observed. The case study showed that while public and private advisers were both technically competent in their extension roles, they played different social roles. Public advisers worked at the interface of the different disciplines and practices assembled for the RD&E task and were the critical social 'glue' that maintained the relational infrastructure that prevented the network from fragmenting.

Convenors:
Carsten Ørting Andersen, Linda Jolly, Erling Krogh, Magnus Ljung, Christina Lundström and Johanna Schokemöhle

Farm education is a way of connecting people to their region and the role of agriculture in their lives. The purpose of this workshop is to clarify the role of farm education in the light of challenges facing European family farms. Possibilities and perspectives for educational farms for both family farms and society will be illustrated in presentations and discussions.

School-farm cooperation on family farms in Norway

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School-farm cooperation has been systematically built up in Norway since the national project Living School began at the Agricultural University (Norwegian University of Life Sciences) in 1996. Cooperation between family farms and schools has occurred sporadically in Norway as long as individual pupils have needed an alternative arena for learning. Until Living School very few ordinary pupils had experienced the farm as a complimentary learning arena. Since 2000 the cooperation between schools and farms has been followed up with university courses for farmers and teachers in many regions of the country. In this paper we will focus on 2-3 such farms and the development of their pedagogical co-operation with nearby schools.

We will begin with a consideration of family farms as educational arenas, the advantages for learning, the effects on the production of the farm, the connection to the community and the possibility of creating a life-style identity for several generations on the farm. T A description of each example farm and its production, facilities and of the participants from the farm seeks to give a picture of the basis for pedagogical activity. The historical development of the pedagogical activities at the farm, as well as the motives for the farm family comprises the second section. This is followed by a description of concrete measures to ensure a safe and adequate learning arenas personal motives of the farm family for the development of an educational enterprise comprises the next (such as building activity, organization), as well as a discussion of economic compensation and contracts. Each farm will also evaluate their work in relationship to the future of the farm and their connection to the community.

At the conclusion, we will look at the challenges for farm-school cooperation and discuss possibilities for further development.

Farm-School Collaboration and the underlying motivation, values and learning goals – Enhancing childrens' academic learning and fostering food citizenship?

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Connecting schoolchildren to farms promotes a greater understanding of farming, sustainability and a connectedness to nature. A PhD case study research analyses farm-school collaboration in Denmark focusing on the integration of farm visits in the curriculum. Different collaboration arrangements are studied and how varying learning goals and values of different stakeholders are integrated and replicated in the programmes, combining qualitative interviews and an analysis of educational materials and activities on the farm and in the classroom.

Farm-school collaboration in Denmark can be put into four categories: ranging from one-day excursions with limited integration in the teaching, to integration of the farm visit into the activities

back at the school, e.g. in different subjects or interdisciplinary projects. The third and fourth types of collaboration are longer; enabling children to follow the seasonal growing cycle and be active on the farm e.g. by having a small plot, where they can grow potatoes. Teachers organize the visits with a farmer over a growing season, but other schools, even municipalities, have a formalized long-term collaboration with a farm.

Preliminary findings suggest that teachers and farmers have quite different learning goals and values. Farmers are highly motivated, believing it is important that children connect to food production, understand the connectedness in nature, that our actions have an impact and that people have a choice, but it is also a means for farmers to present and bring about an understanding of (conventional or organic) agriculture in the public. Teachers' objectives are linked to subjects and ministerial requirements. Some have a broader focus on developing children's action competence, critical thinking and food citizenship. Yet some teachers lack knowledge, motivation and time, limiting the integration in the classroom.

Collaboration between farms and schools in Sweden – what does it take to succeed?

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In the new curriculum for the Swedish comprehensive school, there is on one hand few formal demands regarding teaching of agriculture and food production, but on the other hand great opportunities to use these contexts for learning in several subjects. The question is how this potential can be utilized? Our study shows that teachers believe that it is important that students know how our food is produced, and many teachers would like to learn more about farming and food production. Teachers believe that the teaching of agriculture and food production should include food security and recycling, and how to decrease environmental impacts. Furthermore, teachers reckon that pupils ought to have an opportunity to grow food in school, and believe that skills as responsibility, cooperation and problem solving can be developed through practical work on a farm. Nevertheless, few teachers visit farms with their pupils and if they do - it is occasional visits. Instead, teaching of agriculture and food production, are carried out as briefings, discussions or by studying books or the Internet in classroom settings. Although the area is considered important and the teachers see many opportunities, they do not exploit the potential they see.
The structural obstacles are large and the added value is not clear. The farms who see educational activities as an exciting area of development must therefore take an active role in the implementation process. This article discusses the characteristics of the entrepreneurs who nevertheless have managed to reach school and translate good intentions into action - collaborations truly systemic and unique in its nature. Further, what makes the partnership come into place? Which of the school's challenges does farm cooperation help to deal with and how is the work rooted in the curriculum? Based on three case studies tentative conclusions are drawn that we hope will support other farmers in their ambitions to bring about tangible interactions.

Measuring interest in agriculture – A pilot study of a project on the role of school farms and subsequent curricular teaching units

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Agriculture becomes increasingly important due to its impact on environment, biodiversity and climate change. Structural changes in farming have tremendously diminished the number of farms, farm

owners and workers as well as the transparency of agricultural production processes. As a consequence, young people today lack opportunities to get into contact with agriculture. Yet, society has to cope with agriculturally-induced problems and to contribute to sustainable development. But how shall today´s young people do so in the future if they have hardly any relation to farming?

One attempt to answer this question is to bring agriculture closer to young people by means of targeted educational activities. Many out-of-class learning locations do so trying to actively develop a basic understanding of agricultural production and its environmental, social and economic impacts. School farms e.g. offer a whole week stay on a farm for school classes, involving their active participation in different fields of primary food production and processing. They intend to make young people get interested in agriculture since interest is widely considered as an important condition for learning.

The aim of our study is to evaluate i) whether school farms are able to trigger and develop an interest in agriculture and ii) whether a subsequent teaching unit at school helps to keep this interest alive. The teaching unit contains four different treatments that systematically vary elements to trigger and maintain interest in a 2x2 design. Pupils´ interest in agriculture will be analysed in an extended pre-post test design before and after a week´s stay on a school farm and after the subsequent teaching unit at school. The presentation will outline the research design and display preliminary findings of the ongoing study.

Farm Based Education and Farm to School in the United States: Networks, Case Studies, Best Practices

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Over the last decade there has been a substantial increase in the interest of food and agriculture in the United States. This movement has been referred to as the “local food movement” and is embodied by communities in a variety of ways. Farm Based Education (FBE) and Farm to School (FTS) programs provide key opportunities for communities to build healthier local food systems across the country. The Farm Based Education Association and National Farm to School Network are both national networks that support practitioners working in these fields.

The aim of a presentation at workshop 1.2 is to share information with the IFSA Community about the FBE and FTS movements in the United States. This presentation will be an engaging opportunity to hear about how this work relates to the Green Care movement in Europe. The presentation will include the following elements:

- Discussion of the Best Practices of FBE and FTS in the United States
- Case Studies of FBE and FTS programs across the country, including Michael Kaufmann from Green Chimneys in New York State. Founded in 1947 and a member of the FBEA, Green Chimneys is a nationally renowned, non-profit therapeutic organization that restores possibilities and creates futures for children with emotional, behavioral, social and learning challenges.
- Highlights of research and evaluation results
- A hands-on demonstration of a farm based education activity to emphasis the importance of interactive learning.
- An opportunity for dialogue and discussion about how to strengthen opportunities for learning and networking between the Green Care and FBE and FTS communities.

Learning on the farm – definitions of basic concepts

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The increasing application of learning on the farm in theory and in practice has led to an equally increasing variety of concepts and interpretations of concepts. This contribution represents an attempt to clarify the terminology used when we talk about learning on the farm in order to facilitate the advancing exchange and cooperations on international level both in theory and in practice. To start with, a definition is suggested for the central term 'farm education'. Additionally, definitions are given for two further concepts which are commonly used in Germany and have the potential to encourage considerations on a clear terminology: 'farm as a learning place' and 'farm pedagogics'. The definitions have been developed by the author in close cooperation with the German Federal Association 'The farm as a Place of Learning' and are open to discussion.

Designing community supported agriculture projects as living learning environments – a dialogical approach to child education and farming

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Supported by the German Fund for Environment (www.dbu.de), an innovative intergenerational education program was initiated on the community supported agriculture farm “Hof Pente“ in Germany. It focuses on connecting consumers with the social, economic and ecological aspect of production and consumption by turning the farm into an intergenerational learning environment that produces food for a regional community.

Green Pedagogy and Research at Educational Farms

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In todays’ community, target group oriented teaching of knowledge for all levels of education is vital. This counts especially for green disciplines. This kind of knowledge transfer is important in the area of agriculture. The population is dependent on sustainable primary production, even if the number of workers in this sector decreases. The “research workshop farm” offers the access to diverse occupations, but it also creates a reference to environmental and natural circuits. Themed to the motto “research to touch” complex knowledge is transferred in a playful way. Green pedagogy includes nature, environmental protection and economy. Also the interaction between nature and agriculture is important whereby sustainability serves as a main concept for the future.

Agrarian education contains the topics nature and animal protection, agrarian circuits and the coverage of sustainable sources of income. Farmers gain additional qualifications in multidisciplinary topics. They develop the economical, ecological and social interaction between agricultural production and a natural and cultivated landscape. The communication of knowledge from research contributes to the development of interdisciplinary innovative networks. Methods for innovative know how transfer are connected to theory and practice. Authentic Learning is a possibility for promoting the cooperation between practitioners, teachers and students. There are many fields of occupation on educational farms. The development of competences of young people is depending on the activities they carry out. Fun, play and adventure are very important when working with younger target groups in such “green

teaching workshops". Farmers are not just producers. They are visionaries in thinking and doing. They can transfer their knowledge at first hand directly to the so called think tanks which allow innovative target group oriented know-how transfer. This is important for making the farm an attractive field of occupation again.

What have we learned about learning on farms so far?

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The idea of incorporating pedagogical activities on agricultural farms has been rapidly growing in the last decade all over Europe. However, the scientific evidence about their effects is still sparse. The same is accounts for the knowledge about optimal set-up strategies. Therefore, this article follows two aims: (1) to summarize several scientific studies that deal with the benefits of educational farms, and (2) to present one study in greater details, conducted 2009 at the University of Wageningen, The Netherlands, which analyzed the goals of three different types of educational programs on farms, and evaluated their success in reaching these goals.

Educational farm – "Sustainable centre of excellence in rural areas"

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Educational farms unify production, innovation and nature. Farms serve as source of interdisciplinary high quality knowledge for young people. Furthermore, based on this topic ideas for interesting prospective new tasks and jobs can be created on the use of natural resources. This implies a broad and innovative rural network.

Which service providers are needed for the implementation of educational farms and the imparting of the multifunctional rural areas?
Advisors, Adjustors, Assessors, Service providers for reputation, Service providers for communication and marketing (market potentials, market niches), Educators, Service providers for teaching materials and concepts.

Therefore private and public institutions need to create these networks of innovation not only to communicate sustainable production processes but also socio-cultural aspects. They have to appoint frameworks and make educational farms attractive for young people in urban areas. To create bonds between rural and urban areas is a new challenge. However it can contribute to overcome prejudices towards rural areas. Quality of life in rural areas should be advertised for urban citizens.
Best practice examples show how important it is to communicate knowledge about innovative agriculture and tradition in an attractive way. The demonstration of job possibilities is of high importance.

For agricultural schools, farms are centres for innovation. In class students gain practical information about innovative methods and developments in the areas of agriculture, dietetics and environment. The sensitization of the population for the needs of agriculture enhances the economic success and reputation. Besides it contributes to a higher added value and appreciation not only on local level.

It is necessary to promote educational farms not only because of the offer of an additional income for the farmers but also because of the importance of making the rural area attractive for young people as an active production area.

The state of the Art of School Farming in Switzerland – the case of SchuB

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The state of the art of School Farmin in Switzerland was established using an analysis of the literature and interviews with experts. The results show us one large nationwide network, part of the image campaign of the farmers' association and a few smaller but enterprising and independent networks in the agglomerations of the bigger cities.

Activities of the main network include 'school on the farm' (1) for primary schoolchildren and 'Agro-Image' (2) and 'Pick-up' (3) (magazine) for students in secondary education. In 2010, 28'300 children and adolescents took part in the eventful teaching programme on participating farms. Importance was placed on practical experience in relevant agricultural fields. (4) In evaluationg the national project 'school on the farm' a series of 15 factors were established to maintain the quality of the programme. Further points will be considered in the planning strategy for 2012-2015 to continuously improve the project.

Contemporary developments ad new attitudes within cities and urban spaces are providing opportunities for new ideas in the culture and education of the citiziens.

Further examples of informal environmental education from the agglomerations of Zurich, Bern, Basel and other Swiss cities are to be found at the following links.

- http://www.agridea-lindau.ch/fachgebiete/paralandwirtschaft/agrotourismus/schluessel_zur_natur/index.htm
- www.ortoloco.ch > link: http://www.youtube.com/watch?v=EI9LwaNTaEw
- http://www.stadt-zuerich.ch/ted/de/index/gsz/angebote_u_beratung/gutsbetrieb_juchhof.html
- http://www.dunkelhoelzli.ch/mitmachen
- http://www.agrotourismus.ch/
- www.schub.ch
- www.agro-image.ch
- http://www.lid.ch/de/schulen/pick-up/
- http://www.schub.ch/index.html?&page_id=39&node=25&level=0&l=2

Convenors:
Marie-Aude Even, Timothy Robinson, Jean-Michel Sourisseau, Pierre Gasselin, Genevieve Nguyen, Jacques Loyat and Pierre-Marie Bosc

We organize a workshop gathering contributions world wide to enable comparative analysis, common understanding and collaborations along four pillars: 1) Evolution of typology of farming systems structure 2) Assessment of local agriculture structural transformations, their drivers and integrated impacts, 3) Emergence of local inclusive information and knowledge systems to empower stakeholders to better contribute to policy dialogue on structural transformations, 4) role of policy in structural changes, possible options, possible tools to support decision making.

Agricultural structural transformations and contributions to sustainable development

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In a given area, different forms of farming (from small-scale family farming to large-scale enterprises) contribute and respond differently to global challenges such as food insecurity, employment, poverty, climate change and biodiversity. Rapid structural changes are happening (for instance land holding size and tenure, use of hired labor, increasing reliance on finance and market integration) but little is known about their impacts. Ongoing agricultural investments have triggered policy debate on the relevance and effects of different business models, and access to knowledge of these is crucial for all stakeholders to be included in policy dialogue.

Given the variety and complexity of ongoing transformations, policy debate at national and international levels should be supported by novel approaches for assessing and monitoring this phenomenon. This approach should at least account for the diverse forms of farming systems; the multiple sectors with which they interact at food chain, territorial and global levels; and impacts on ecosystem services spanning environmental, economic and social dimensions.

This paper presents a short review of the literature on agricultural structural change and discusses options to characterize different patterns of change, as compared to that which took place in developed countries in the second half of the 20th century. It proposes an analytical framework to monitor and evaluate these changes in order to improve policies through an assessment of the contributions of different types of farm organizations to sustainable development. In a given territory, and in the relatively long term, transformations can be described at least partly, by the changes in farm types. These structural changes are the result from strategies implemented at farm level to adapt to changing economic and environmental contexts.

The future of the food system: cases involving the private sector in South Africa

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The global food system is facing unprecedented pressure from global change processes. These pressures are exacerbated by transformations in the food system through the expansion of agrifood corporations that are consolidating their power in the global food chain: in their control over the technology of production, the distribution of food commodities, their procurement policies and marketing techniques. Although Africa largely missed the Green Revolution and the subsequent wave

of supermarket expansion that hit the West and then spread to Asia and Latin America, this is unlikely to continue. With a large proportion of sub-Saharan African countries' GDP still heavily reliant on agriculture, global trends in agrifood business are having an increasing impact on African countries. South Africa, a leader in agribusiness on the continent, has a well-established agrifood sector that is facing increasing pressure from various sources, including climate variability affecting production, a global drive towards 'sustainability,' certification and the need to support local capacity development especially in the agricultural sector. Using a socio-ecological systems approach that appreciates both the environmental and socio-economic drivers of change affecting processes in the food system, this paper situates the future of farming systems under these drivers of change and looks at how they can be harnessed to improve the adaptive capacity of the food system to an uncertain future. The paper uses qualitative data from preliminary semi-structured interviews with corporate executives from two South African food retail companies. Based on this information, the paper draws conclusions regarding how macro-trends both within and outside of the formal food sector are having repercussions for farming systems. These include the recognition that building resilience in the face of an uncertain and complex food system requires a holistic persepctive that capitalises on the system's diversity and provides a governance structure that incentivises business to develop strategies that incorporate the needs of other actors.

The industrialization of animal agriculture: Implications for small farmers, rural communities, the environment, and animals in the developing world

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The livestock sector is rapidly industrializing, particularly in developing or emerging economies, where most of the growth in meat production is projected to take place (OECD-FAO, 2011). Approximately 80 percent of the growth in this sector is already in the form of industrial farm animal production (Steinfeld et al, 2006). Worldwide, industrial systems account for approximately two-thirds of egg and poultry meat production and over half of pork production (FAO, 2007), with developing countries producing approximately half of the world's industrial pork and poultry (Steinfeld et al, 2006a). At the same time, there is increasing consolidation of holdings in the farm animal sector (Steinfeld et al, 2006b; FAO, 2009). Between 1980 and 2000, global pork production nearly doubled, with a decrease in the total number of farms and an increase in larger facilities raising 1000 or more pigs (Cameron, 2000). In India, six large poultry companies account for nearly 40% of the egg industry (Rattanani, 2006). In addition to such concentration, farm animal production is becoming geographically clustered (FAO, 2009). Between 1992 and 2001 the proportion of pigs housed on 5% of Brazil's land area rose from 45% to 56% (Steinfeld et al, 2006). It is important to evaluate these trends for impacts on social and development goals. For example, a 2010 study found that animal agriculture alone will help push the planet to the brink of several sustainability boundaries (Pelletier & Tyedmers, 2010). Industrial animal agriculture has been shown to threaten the environment due to waste management challenges (Pew, 2008) (U.S. EPA, 2003). The economic concentration in the farm animal sector been shown to push small farmers out of the market and reduce employment opportunities (McLeod et al, 2009, Ikerd, 2004). This paper will analyze peer-reviewed studies, government data, and industry reports in order to better understand the impact of these structural changes on environmental sustainability and household food security in developing countries.

Collective actions and the dynamic of agrifood system from the perspective of the Romanian small vegetable producers

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The integration into the world trade and particularly along the chain of products with high value added, such as the vegetables chain, is considered as a promoter of growth and poverty alleviation (Aksoy and Beghin, 2005), even though this topic is subject to controversy. The paper's purpose is to assess the role of collective actions in farmers' participation in the Romanian supply chains, more exactly the possibility of farmers to adapt to the dynamic retail chains using new institutional economic theories. Having given the requirements imposed by retail chains to vegetable suppliers in terms of quantity, quality, frequency, food safety, it is expected that a small farmer cannot afford to participate individually in the retail chains due to high transaction costs, lack of scale and institutional changes required. In order to see the determinants of joining collective actions by farmers, binary logit/probit models were used. The results signal out a small degree of farmers' participation in collective actions. Also, they reveal a certain degree of uncertainty among stakeholders in terms of institutional arrangements and participation in collective action.

Animal production systems in Algeria: transformation and tendencies in the Sétif area

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In spite of its large area (2.4 million km2), Algeria has only 8 million ha of UAA, of which only 443 000 ha are irrigated (0.05%). With a population of more than 30 million inhabitants, the country registers 0.25 ha per capita, which represents a very low ratio. Agriculture is concentrated in a narrow fringe concentrated in the North, where the dominant climate is semi-arid with very irregular rainfalls. In the South, a steppe area of more than 30 million ha is mainly devoted to small ruminants' production. A majority of farms produces its main part of income from cereal crops–livestock association system. However, the diversity of the climate and the physical environment, on one hand, and the agricultural policies on the other hand, induce major transformations in these systems. Transformations are also the result of a significant demographic growth in rural area. This fact is translated by an increase in food needs. In this context, significant issues appear in term of resource's uses and systems' sustainability. To shed light in the actual situation, this study, based on a survey of 90 owners, shows that: - the intensification can constitute a threat on the pastoral resources; - the weakness of the farms encourages the generalization of practices characterized by a weak feed autonomy and a bad management of stock fodders; - the animal interspecific integration and partial intensification are positive if they follow models which ensure autonomy, performance and optimal pastoral resource management.

(Semi)Subsistence Agricultural Systems in Sierra Leone: Present and Future Challenges

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The views expressed are purely those of the authors and may not in any circumstances be regarded as stating an official position of the European Commission.

The Government of Sierra Leone has recently published its National Sustainable Agriculture Development Plan (NSADP) 2010-2030 which contemplates the gradual erradication of shifting cultivation practices and the active promotion of vertically integrated processing and commercialisation chains for selected staple (rice and cassava) and export crops (cocoa and coffee). The aim of this article is to examine the implications of the changing agricultural policy for (semi)subsistance farmers who represent about two-thirds of the Sierra Leonean population. For this purpose farm typologies are introduced according to the diversity of cultivated crops. The analysis focuses on smallholders' food security, employment opportunities and access to inputs and natural resource. For this purpose, socio-economic data from a 2009 survey to 600 farm-households under the two main production systems of Sierra Leone are used. Results illustrate the potential impact on rural livelihoods during the implementation of the NSADP (including land leasing processes) and the challenges related to the transition period required to effectively replace shifting cultivation with permanent agricultural systems.

Large scale foreign land acquisitions in Madagascar: what interactions, opportunities and risks for different local farming systems?

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Important foreign land acquisitions in developing countries can lead to structural transformation in existing farming systems. But does the development of mega-farms create the same opportunities and risks for the diversity of local rural households? Based on a case study in Madagascar, this paper deciphers the transformations of the local agrarian systems due to the implementation of an agrobusiness company, aiming to produce jatropha on 5000 hectares. Focusing on the local level, it deciphers the ongoing impacts and tries to overcome a vision of the "local community" as an homogenous and congruent entity.

Even if the plantations are still small (230 hectares), the company implementation impacts on the local labor market (wage increase, transition accelerated from mutual aid system to labor market), migration flows (new immigration and less seasonal emigration), the local farming systems (vegetable production stops due to commoditization of manure, development of onions thanks to new comers' experience, adaptation of cattle bredding). Above all, the company plots encroach on appropriated land and generate conflict with the villagers. While the smaller farmers benefit from the company implementation (jobs, infrasctures access), the larger famers and herders are the ones who lose access to land, experience an income decrease and then oppose the company implementation. The company development also reactivates land conflicts between villagers (schematically *Betsileo* farmers and *Sakalava* herders) who both compete to have control over land access. Hence, neither investor nor local landwners manage to have secure and legal land rights.

A better understanding of the agrarian system and the local tenure practices is necessary to identify the diverse stakeholders and interests in welcoming/opposing the company. A better view on whom benefit/lose from the company development, whom has land rights and whom has control over

land access gives opportunites to enhance negotiation processes, improve legal empowerment and avoid violent conflictual situation, detrimental for the investor and the local inhabitants.

From Investment funds and Asset Management Companies to questions about Africa's farmers

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Linked to agricultural liberalization and deregulation, the recent food price crisis resulted into macro-actors' development and direct engagement into agriculture and land, particularly commercial banks, investment funds, asset management companies. These institutions developed renewed models of agricultural production and land acquisition: pre-crop model, input finance model, equity and investment fund models, partnership and share equity scheme models. Often less visible than direct 'land grabbing', these new models of agricultural productiona dn investment are vectors of profound agrarian restructurings, leading to questions regarding the concentration of land and of the agricultural sector in the hands of a few (international) (agri-) businesses, the status of (family) farmers and regarding the increasing inequalities that are arising. The paper describes and analyses the different agricultural production models being developed in the South African context and discusses their application and implications for the country's as well as the continent's agricultural development trajectories. These issues are essential considering that in the absence of alternative development models, this conception of agricultural development presently becomes the reference paradigm, in South Africa but also on the continent. It is indeed adopted by public development agencies (NEPAD, AfDB) and is exported by these "macro-actors" within the framework of their economic expansion on the African continent.

Integrating Smallholders into the Global Economy: Agri-businesses, Contracts and Public Policy in South Africa

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This paper intends to contribute to the on-going debate about whether and how agricultural market restructurings can provide viable opportunities for small-scale farmers in Africa. It aims at analyzing contract farming from the smallholders' perspective and at understanding the implications regarding contractual arrangements with processing agribusinesses and/or export firms. Using an original approach that allows linking farm level analysis to territorial and value-chains levels analysis, the research intends to better understanding the complex and multidimensional implications of agricultural structural change.

Based on case-studies from the citrus sector in South Africa, the paper argues that contract farming is not a panacea for smallholders. On one hand, contract farming can improve production for farmers; it can also enable better access to services and resources and create real opportunities for smallholders to participate in modern markets. However, on the other hand, the investigation shows that contract farming remains limited both at territorial and value-chain levels: it, mostly involves the already better-off and the larger-scale farmers who have benefited, among others, from significant public support. Moreover, when contract farming includes a handful of smallholders, it can lead to a loss of control and decision rights over production and resources. Overcoming these challenges is essential. The latter will need to be complemented by other measures allowing not only the integration

of smallholders into the global economy, but the broader agricultural transformations and structural change.

The emergence of "firm" agriculture in France: Characteristics and coexistence with family farms?

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Up to now, French agricultural production is mainly based on family farming systems. The Common Agricultural Policy (CAP), at its creation in the 1950s, set up indeed the development of family farming systems to achieve food self-sufficiency as a clear policy objective. Fifty years later, in year 2000, the CAP reform promoted the concept of multifunctionality, with the aim to defend a certain model of agricultural development where the role of family farms was reinforced. Despite this apparently strong policy support, the model of family farming appears not to be universal nowadays. Field surveys of farming systems conducted within our "Agrifirm" research project in different regions of France, as well as in-depth interviews with stakeholders of the agricultural sector, report evidences of the emergence of new forms of agricultural production, which appear to be very different from the model of family farming. The main objectives of our communication are, first, to present an interdisciplinary conceptual framework we have elaborated in order to better characterize new forms of social and economic organizations of agricultural production, and second, to present the preliminary results of our regional case studies. We focus on the study of the rice farming systems in the Camargue region, located in the South-East of France, where we have found very diverse forms of new organizations associated with "firm" agriculture (agricultural service-supply enterprises, corporate farms, "family capitalism" farms, etc.). A typology is presented based on several major organizational and functional criteria, such as a complex form of governance with multiple logics, a new relationship to markets and to resources, a new organisation of labour. Finally, we discuss the determinants of the emergence of these new forms and the dynamics of the coexistence of these new forms with the more traditional family farms. We draw the hypothesis that the colonisation history of the Camargue region, its natural and geographical characteristics and the agricultural policies are among the major determinants. Despite the fact that the Camargue presents some very specific characteristics, the pattern of farming systems observed there could be found in other regions of France. This last observation brings us to the second hypothesis that the emergence of "firm" agriculture is a more general phenomenon, associated with the transformation of French agriculture in the context of globalization.

Rural Transformation and Structural Change: insights from Developing Countries facing Globalization

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Agriculture has a key role in development and poverty reduction. But beyond its role in producing food, it should also generate activities, income, and employment to facilitate rural transformation and structural change. This is particularly the case for developing countries facing the challenges of incipient economic transitions and quickly evolving demographic context characterized by growing cohorts of new labor market entrants. While a larger labor force offers countries new opportunities for growth related to the "demographic dividend," it also could pose socio-political risks if investments and public policies are inappropriate to support the processes underway.

The paper explores rural transformation and structural change by presenting an in-depth analysis of the socio-economic development of rural, mostly agricultural-based, regions in Africa and Meso-America where the RuralStruc Program collected and analyzed about 8,000 rural household surveys. The results of the Program show that contrary to conventional wisdom, the liberalization of agriculture has not led to a massive agricultural restructuring or to a rapid integration of farmers into the global economy. Neither has it led to the development of the buoyant rural non-farm economy so often discussed in the literature. The investigation also shows a strong relationship between income and the diversification/ specialization of rural households in terms of economic activities. An " inverted U" pattern is observed and can be understood as follows: whereas poorer households diversify to mitigate risks, households that are more well-off can make larger investments and begin to specialize to take advantage of these new assets. In Sub-saharan Africa in particular, high level of risks and limited economic opportunities constrain households' options and hence their economic returns. This situation can generate possible poverty traps for low-income farmers. Considering these socio-economic challenges in light of the dramatic demographic shift underway on the continent, policy orientations should reintegrate structural issues and avoid short-term policy priorities, which have driven most of the agenda over the last 30 years.

Shifting practices or shifting discourses?: The role of small-scale agriculture in sustainable food systems past and present

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Small-scale, mixed farms — once the modus operandi of Canadian agriculture in the pre-WWII and early post-WWII era — have been marginalized within modern agriculture. Their marginalization is largely a consequence of their failure to specialize and modernize at the rate of industrial agriculture. In today's agricultural discourse and policy circles they are perceived as the quintessentially failed farms of yesteryear — and some agricultural policy analysts have come to refer to these operations as 'hobby or pension' farms. But in light of the 2008 global food crisis and the call for more sustainable production practices (as a result of the damage to our ecosystems from mono-crop agriculture, its overproduction and pushing of natural ecosystems, and high reliance on herbicides and pesticides), 'small' mixed operations are more compatible with the local food movements' visions of a future food system. Using multiple methods, this paper presents a case study of the relationship between policy development and agricultural practices in New Brunswick, Canada — where rural life remains an integral part of the political and social landscape. By documenting how the meanings and discourses surrounding farm practices shift in tandem with farm practices, it argues agricultural policy development is a key driver in the structural transformation of agriculture. At the local level the case study documents the persistence of small farms and their exclusion from policy debates, while arguing their ongoing existence may provide the space for the development of alternative, more sustainable agricultural practices in the future.

Do political changes regarding livestock farming, beef supply chain and Amazonian forest protection, contribute to ecological intensification?

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Since 2008, Amazonian agriculture has been faced with radical changes in Brazilian policies regarding agricultural land use and the preservation of forest areas. The viability of livestock systems is threatened, revealing the emergency for technical, organizational and social alternatives which could bring about a sustainable development of agriculture in this region. Alternatives are experimented by public extension services and private operators in order to find an outcome. In this context, how do these alternatives contribute to put into debate what is ecological intensification? Ecological intensification, defined as an ecologically friendly agricultural development, is envisioned as a possible way to conciliate the existence of the beef supply chain and the protection of forest ecosystems in this region. Taking the examples of three municipalities of the Pará State, the authors analyze the points of view of different categories of actors involved in livestock farming and beef supply chain. The results show that the alternatives often deal with classical ways of intensification, which are hardly affordable to small farmers, and put forward other kinds of ecological risks and damages.

Heterogeneity and vulnerability of livestock farming in forest plantations in Uruguay

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In this paper we study the situation of livestock farmers related to the afforestation of the northwest region of Uruguay and suggest that their vulnerability has characteristics that vary according to characteristics of the modified ecosystem in which they operate and develop their resource endowments. We present an overview of mixed farming that includes trees and especially those that include cattle grazing. It is shown that the development of these systems has been associated with incentives from public policies, the demand for primary goods and the emergence of forms of agricultural organization that had not been present in the country. It presents various aspects of developments in the areas where forestry has shown great progress, justifying the need to elaborate on knowledge of the consequences of these changes. In particular, it proposes an approach that emphasizes the identification of interactions that we consider to be beneficial for both items. Briefly reviews some consequences that are manifested in changes in ecosystem services and the changes are associated with the original holding in the region: livestock. To analyze differences in vulnerability among farmers and in particular how this feature is affected by its connection with afforestation present a typology and the results of a series of interviews conducted archetypal representatives of the types we offer. Our study shows that differences exist between farmers associated with the afforestation that allow us to propose that will be affected differentially by changes that occur and the desirability of developing differential offers training and include consideration of public policy proposals that improve their situation. In particular, the valuation of environmental services throughout the silvopastoral systems can result in improved income from these new players in our national agriculture.

Understanding farmers' land rationales in the context of urban sprawl

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Even if European and French policies aim at reducing agricultural land consumption for urban development, tnhe equivalent of one French department area is built each seven years. The implementation of French land use planning policies is supposed to integrate the cooperation of agriculture professionals, as a governance form of public intervention. Considering this, we assume that there are some learning failures in the cultural integration between politics and agricultural sectors which may explain some misinterpretations of farming systems issues. In this paper, we expose a method to unravel farming systems dynamics in the context of urban sprawl, as understanding this means integrating on one hand the complexity of agricultural working systems, on the other hand the complexity of the different impacts of urban sprawl on these systems. With this aim in view, we present a new way to study farmers' strategies. Our approach is based on an analysis of farmers' decisions, coupled with their motivations. We identified five action levers and four distinct farmers' rationales with regard to land management decisions, and also their interdependencies. This method could also be used to study other types of farming systems' structural changes.

The activity system. A position paper

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From a broad review of the literature and empirical studies conducted in Latin America and in France, we consolidate the concept of activity system applied to small-scale agriculture. This concept brings together fundamental works of various disciplines on the notions of activity, work, knowledge, resources, decision-making and rationality, dynamic of systems, innovation and development. It provides a global analytical framework that can be applied to a specific context and a given issue. This in turn imposes to define its components (social entity, activity, motivation and resources) and its environment. The study of the interactions and of the dynamics, especially in its historical dimension, is intrinsic to the activity system approach.

WAW proposed methodological framework to assess agricultural structural transformations and their contributions to sustainable development: monitoring and assessment better to inform policy

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Informed decisions on the diversity of agricultural holdings and the choice of future pathways of agricultural transformation can play a decisive role in society's response to several global challenges. To make such decisions - spanning policy, institutional and technical dimensions - it is essential to monitor objectively the extent and impacts (social, economic and environmental) of ongoing and most-likely future pathways of transformation both at the detailed level of agricultural holdings as well as at larger 'territorial' scales. The World Agricultural Watch (WAW) is proposed as a platform for effective global monitoring of rural and agricultural transformation.

This paper presents the methodological framework proposed by WAW based on a systemic approach (concentrating on relations between variables rather than on the sectoral variables) focused on the different forms of agricultural organization, their dynamics and contributions to sustainable development. It makes reference to existing tools or methodologies; notably an adaptation of the Sustainable Livelihoods framework and propose options to elaborate typologies of agricultural holdings and a core set of parameters and indicators to permit international comparisons. Continuous monitoring (as opposed to a one-time assessment), as well as projections of future paths, are key inputs in stakeholder evaluation of options during policy and planning processes, at different scales.

DIALECTE, a comprehensive and rapid tool to assess the agro-environmental performance of farms

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Solagro has developed DIALECTE, a comprehensive, holistic and quick tool to assess the agro-environmental performance and the ecological sustainability of farms. It is applicable to any type of farming system in Europe. The tool was designed to help farmers identify scopes for improving the sustainability of agricultural production on their farms. DIALECTE's rating system is based on the principles of agroecology, integrated production and organic farming: it favors diversified farming systems, high levels of biodiversity, systems that are adapted to local conditions, and the use of abundant rather than rare resources. The tool calculates 43 agro-environmental indicators to produce (i) a farm-scale approach that assesses the farm's diversity and the management of inputs, and (ii) an assessment of the potential impacts of the farm on water, soil, biodiversity and resource use. DIALECTE is freely accessible, available in several languages on the Internet (http://dialecte.solagro.org). A database allows sharing and comparison of the results.

The methodology and three examples of DIALECTE's implementation are presented. The value of using this kind of tools is discussed.

Impact on erosive runoff and costs for local communities of usage scenarios of agricultural soils: the case of Pays de Caux (France)

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Recurring mudflows in the silty areas of North-West Europe and particularly in Pays de Caux (France) result in significant costs for local communities. These flows result from erosion processes which occur on agricultural land located upstream of urban areas. Farming practices depend on changes in external factors (prices, regulatory system) that may lead to an increase in erosion and mudflows issues. Public-action programs can limit the possible damage of these changes but any strengthening of these policies (compensation for farmers) induces costs for the community. Our goal is to examine the economic feasibility of action programs designed to counter some agricultural scenarios driven by changing external factors. To do so, we compared the cost of compensating farmers with the local populations' willingness to pay (WTP). We built scenarios of changes in farming systems with a 2015 horizon at the scale of the Pays de Caux, 2007 being the initial situation. We chose two scenarios of the disappearance of dairy farming, since local stakeholders were concerned with the future of local livestock farming and particularly by trends of declining dairy farming. One scenario (StopMilk) did not include any public-action program, the other one (StopMilkEnv) involved a program based on the funding of environmental-friendly cultivation techniques . These scenarios were assessed at the small

watershed scale (7 km²) in terms of both changes in farming systems and effects on runoff. Finally, the economic evaluation of additional costs of StopMilkEnv was extrapolated at the level of the Austreberthe watershed syndicate[1] (214 km²). Our results show that StopMilk leads to a significant increase in runoff, whereas the local public-action program proposed with StopMilkEnv reduces runoff below the 2007 level. The willingness to pay of the residents of the Austreberthe watershed for a 5 years program was around €395,000/year and a comparison with the cost of the environmental-friendly cultivation techniques revealed that the funding of such practices would be possible but would require borrowing by the community.

How to design a pro-poor payments for environmental services (PES) mechanism in the forest frontier? Lessons from action research in Madagascar

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PES are considered new incentive tools for managing both the environment and rural development in developing countries. However, designing mechanisms tailored to smallholder characteristics and rural development requirements remains a challenge, particularly in tropical countries where the forest sector is characterized by long-standing patterns of inequality and poverty. In order to switch from theoretical principles to a really innovative management tool addressing local issues, we argue that it is necessary to include as from the beginning the characteristics of agricultural dynamics, and to involve local stakeholders in co-designing the ES and in solving problems encountered in their delivery. Through an action-research framework, we explored the characteristics of a "pro-poor" watershed-based PES mechanism associated with a hydropower project. The study site is located in the agricultural frontier of a rainforest in eastern Madagascar. We built a local and inclusive knowledge system based on (1) local and scientific knowledge on the relationships between land use and water services, (2) stakeholder perceptions on the electrification project, and (3) the heterogeneity of livelihoods of targeted households. We were then able to clarify what the environmental service and governance scheme could be. The main results show the necessity of going beyond economic and hydrologic rationales that usually underlie watershed-based PES development. In conclusion, we point out the main elements that underlined the design of a pro-poor PES scheme able to accompany or promote the changes that are advisable for agriculture in the forest frontier.

[1] A watershed management syndicate is an organizational management structure in France, spanning several communes, that manages all matters relating to water erosion and its consequences within its geographical ambit.

Convenor:
Lesley Hunt

We live in an historical context in which governments either promote market-led or interventionist policies, thus impacting on the expression of the value of farming in many diverse ways. In doing so the balance between economic/business objectives and other social or environmental objectives is affected. It is an approriate time to examine and compare the impact of governments' agricultural policies - what has changed as a result and what has been lost and what gained.

Changing what it means to be a 'good farmer': study from AGROS of the impact of neoliberalism on New Zealand farmers

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A recent part of the Agriculture Research Group on Sustainability (ARGOS) transdisciplinary study of New Zealand farming was a retrospective interview of all ARGOS sheep/beef, dairy and high country farmers, and kiwifruit orchardists in which their responses to 'shocks' over the past forty years was explored in order to examine farmer resilience and pathways to sustainbility. What was apparent was how the 'good farming' model was expanding to include the notion that it was culturally acceptable to think of farming as a business. This change, which could be attributed to the influence of the environment of neo-liberalism in the policies of the New Zealand government since the 1980s, was freeing up farmers and orchardists to think of themselves and their role in new ways that provide unexpected and exciting possibilities for the resilience and sustainability of the agricultural and horticultural sectors in New Zealand.

The Problematic Nature of Agriculture: Understanding the Perils and Pitfalls of Improving on Nature

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It is our contention that agriculture as an economic activity has not been adequately theorized. As a consequence, the social and ecological roots of agriculture's accelerating ecological difficulties are misunderstood.

The key to theorizing agriculture is the recognition that farming is an effort to create and sustain artificial (man-arranged) ecosystems of varying degrees of instability, in order to increase what liberal economists would call "the productivity of natural capital". This article attempts to develop a systematic model of agriculture which will incorporate 1) a clear delineation of the work processes involved, 2) their particular form of dependence on the biosphere, 3) the source of social pressure towards expansion of production, 4) the particular reasons for the forms of environmental degradation which these cause and 5) the ecological consequences of this degradation for the continuance of farming itself.

Many may well argue that developing an explicit theory of agriculture is unneeded; everyone thinks they understand farming: people on tractors growing crops, or out in the barn raising animals. While not wrong, we argue this understanding is very superficial. It also fails to grasp the relationship between agricultural work activities and the metabolism of the natural environment upon which they depend. The theory of agriculture we propose provides, we believe, an immediate insight into the reasons agriculture causes so much ecological disruption and the sources of its own ecological

instability. It makes clear how the drive by capitalist enterprise to expand the accumulation of capital from agricultural activities exacerbates an inherent tendency toward environmental damage and the inherent ecological instability of agriculture. And it suggests that the task of making agriculture and the food system ecologically sustainable is far more problematic than generally recognized.

The Japanese farmers' dilemma: Should pro-liberalization policies lead to structural transformation of the Japan Agricultural cooperative?

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Agriculture in Japan has witnessed consistent policy protection and support since the end of World II. The protectionist policy gave fairer trade and subsidy treatment to Japanese farmers than their counterparts in the Organization for Economic Cooperation and Development (OECD). The policy also created trade barriers in the Asia-Pacific region, placing very high tariffs on certain agricultural products such as rice and milk. However, since the changes in political dynamics in Japan in 1995, there has been a shift towards liberalization in the agricultural sector. This has implications for the structural transformation of Japan Agricultural cooperative (JA) whose role in political and trade negotiations sustained the protectionist policy. JA's financial and trade businesses also enjoyed overwhelming support and protection from the government for about five decades. The policy changes also brought to the fore the need for agricultural competitiveness in the Asia Pacific and the need for Japan to join the discussion forum for the Trans Pacific Partnership Agreement (TPP). Japanese farmers are now left in a dilemma of retaining their inefficient, small scale production system or accepting the need for structural transformation of JA and facing the challenges of trade agreements. This paper examines this dilemma. Data for the study were collected through desk review and field level survey among the 2,914 regular and associate members of JA Oguni-go in Aso County, Kumamoto Prefecture, Southern Japan. The field survey involved responses of 91 farmers to a questionnaire, personalized interviews with 22 farmers and four JA/city officials and 12 focus groups representing each commodity group. The localization of the JA system could create competitiveness among local communities and the existing market network and the organizational strength of JA can also be utilized to overcome the dilemma and perform efficiently in the face of the changing policy.

Convenors:
Cees Leeuwis, Alex Koutsouris, Laurens Klerkx, Annemarie van Paassen and Barbara van Mierlo

Systems thinking has become pervasive in the scientific and policy discourse on agricultural innovation, but concepts such as innovation systems and system innovation are still in full development. This workshop aims to stimulate critical reflection on the concepts and their applications. It aims to unravel the different interpretations of innovation systems and systems innovation thinking, and different operationalizations (in terms of research methodologies and interventions), and attempts work towards to a more unified perspective.

Knowledge networking among actors of Rahad Agriculture Scheme, Eastern Sudan

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Establishment of Rahad Agriculture Scheme in Eastern Sudan since the1970s could represent a situation of agricultural innovation system where a set of different actors are involved to achieve a certain aim from the innovation. Research, extension, investment, and marketing institutions, as well as agro pastoral farmers have been networking to provide better livelihoods within the irrigated scheme area. Functioning of Rahad Agriculture Scheme has been an inspiring research question for my thesis study.

The investigation does with the question, how knowledge on farming has been networked among actors of the scheme so as to facilitate innovations process within Rahad scheme area.

System thinking was suggested as a methodology to search knowledge networking among actors in Rahad. Accordingly, Relaxed Appraisal for Agriculture Knowledge System (RAAKS) was conducted to identify roles and objectives of relevant actors in Rahad. It was used to define knowledge sharing among actors, and finally RAAKS is to be used to suggest future strategies to improve knowledge networking among actors of Rahad Agriculture Scheme.

A RAAKS team was formed and one day orientation workshop on RAAKS methodology was implemented. Performance and communication among actors within the scheme were analyzed with 15 relevant actors using individual interviews and brain storming session. Individual interviews and group discussions were used to understand farmers' communication with the rest of actors within Rahad scheme.

Direction of analyzed results is to understand strong connections and weak connections among actors of Rahad Agriculture Scheme. It is also to suggest ideas of how weakened communication networks can be strengthened. Finally, a methodology to improve performance of Rahad Agriculture Scheme can be worked out.

Water for the Desert: Participation And Integrated Water Resources Management for Rainfed Agriculture, A Case Study of The Rainfed Desert Region of Matruh, Egypt

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Water resources are under threat from complex social, economic and environmental interactions. Integrated Water Resources Management (IWRM) is widely advocated throughout the literature (Pahl-Wolst et al., 2007; Saravanan et al., 2009) to cope with the complexity of adaptive capacity for

sustainability. IWRM articulates multi-stakeholders' participation and social learning to foster an innovative and transformative approach towards environmental change. Using qualitative field data from the rainfed Matruh region in Egypt, this paper evaluates the contribution of stakeholders' participation in advancing IWRM with regards to equitable allocation, empowerment and sustainability. It analyses whether stakeholders' participation fosters a sustainable use of natural resources. It argues in its case study that the politics of water management are seldom considered in IWRM. Consequently, equity and empowerment gains are captured by power differentials, which thus constrains its sustainability potential. By doing so, it expands the literature on IWRM with a political sociology angle.

Finding farmers' motivation - a key to sustainable farm development through interventions

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Recent studies show that the viability of Swedish farms lies below the long-term sustainable level, a negative trend over the last 10 years. Different actors within the agricultural sector have responded by trying to stimulate farmers' entrepreneurship and innovative capacity. We argue that one can identify four distinct phases.

The first phase, beginning fifteen years ago, was when the Swedish Farmer's Federation (LRF) launched the competence project "The Farm Business Manager". One central part was to pinpoint the distinction between the farm manager's life idea and his business idea. A broader view on farmers' motivations and driving forces were introduced. In the second phase, starting in 2000, the focus shifted towards external cost reductions, arguing that better preconditions for rural entrepreneurship and innovation were needed to motivate farmers to take action. But not much happened within the farming community.

In 2006 a new advisory concept was borne; "Future dialogues". The debate within advisory services shifted from farmer's attitudes, values and preconditions, toward the learning process that farmers needed to be engaged in. Later this third phase developed into business coaching. The fourth phase, beginning in 2009, can be conceptualized as the introduction of lean production. It is understood as a way to change the whole mindset of the farmer, while simultaneously taking incremental actions.

We critically examine the development of advisory concepts in Sweden, which reflects a lack of basic understanding of learning, change, and innovation among farmers. The common denominator for most initiatives is well grounded, in that they focus on the farmer's motives and capabilities. But similarities between concepts are put in contrast to a relative low level of success. Our main argument is that a deeper and systemic understanding of farmers' lifeworld and Weltanschauung is necessary. Some recommendations for extension competence and policy are given.

Development-led innovation?: Concepts and challenges in changing agricultural RD&E systems in Australia

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Models of rural innovation have evolved over time with much current interest in the systems and arrangements that balance knowledge production/technology development with end-users and practitioner adaptation. Strong network linkages amongst innovation actors in co-developing new technologies or social learning for systemic change is a suggested design feature for agricultural and

resource management innovation. However, there are increasing conceptual and practical challenges in creating and governing such systems for innovation. The challenge of organising for innovation has come into recent focus in Australian primary industries through federal government initiatives focusing on greater efficiency and effectiveness from research to support sector productivity (PISC, 2010). With multiple research organisations and interests and geographically distributed practitioners and communities, questions about how to organise and manage for enhanced innovation have come to the foreground.

This paper reviews and analyses four different models or approaches to innovation conceptualised as operating in the Australian dairyfarming sector between June 2009 and 2010. The unit of analysis was the innovation program area or domain (e.g. milk quality, animal performance or people development) rather than specific projects or specific practices or technologies. The strengths, weaknesses and risks associated with the different models are explored. One particular model, (named by the authors "Development-led innovation") emphasises the need for and role of program development as a social platform whereby public and commercial interests and networks are engaged in ongoing, joint action. This model mirrors key features of open innovation and may be best considered as a support structure for innovation. Challenges in implementation concern the governance arrangements; the re-configuration of "research-led" innovation cultures; and the measures of "development" success.

Multi-stakeholder creation of social-ecological win-win solutions – mangling sustainable nitrate reductions in a Danish sub-catchment setting

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The purpose of this paper is to explore why multi-stakeholder creation of win-win solutions and sustainable transition processes turn out to be so difficult in social-ecological management practice.

The paper is based on a qualitative longitudinal case study of decision makings within a group of primary stakeholders of water environmental management organized around a sub catchment to a Danish fiord. By way of participant observation I follow the collective search for and construction of measurements to nitrate reduction that are potentially sustainable in the sense that they prove beneficial to all of the involved stakeholders.

I take a process analytical, performative and STS inspired approach (e.g. Pickering 1995) to unveiling the micro-political processes involved in multi-stakeholder managing.

Through an analysis of the emergence, decision making and closing down of decision events, I identify material and social aspects of agency, their 'interactive stabilizations' and how they come to determine the continued structuring of win-win potentialities.

In line with the performative approach, no pre-analytical assumptions of specific stake-holder interests and perspectives are made. Rather perspective formation is empirically investigated and special focus put upon how stakeholders' mobilize material and social elements in searching for certain courses of nitrate reducing action.

Stakeholders draw on elements of an existing water management regime. But instead of seeing the regime as something external and structuring to practice, I argue that an approach directly interested in sustainable transition has to view regime elements as instrinsically interwoven with and internal to practice.

By explaining in this manner why the construction of win-win solutions is so difficult in practice a more profound understanding of transition management is reached for.

Re-orienting rural innovation

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The modernization of agriculture is resulting in an increasing disconnection between farming, nature and society, creating a series of social, economic and ecological crises in the food chain. Rural innovation starts where innovative practitioners successfully adapt their farm in a step-by step innovation process. From a radical prospect on the role and functioning of the farm it gradually unfolds as a productive farm that matches changing societal needs. This type of systemic configurations unfolds in different contexts but shares the common characteristic that the adaptations – conceptualized as novelties – are guided by a re-orientation towards the local (ecological and socio-economic) resource base. Promising farm practices can be further strengthened when scientists explore, test and verify the interrelations between novelties whilst politicians and policy makers pursue an objectives-led policy (instead of implementing prescriptive measures) that allows for and stimulates the exchange of novelties between producers and promotes scientific research on promising novelties.

Toward a reflexive framework to compare collective design methods for farming system innovation

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Faced with strong environmental issues, the agricultural sector has to revise deeply its aims and performance criteria. Theories and methods are urgently needed to foster the design of innovative farming systems reconciling production with other ecosystem services, while taking into account heterogeneous stakeholder viewpoints in situations of high uncertainty (Voβ et al, 2006; Leeuwis, 2004).

Numerous methods have been proposed over the past decades to facilitate collective learning for environmental management (Reed, 2008). Most of them promote problem-solving or scenario-based approaches to tackle issues such as common goods management, with in particular methods grounded on Role-Playing Games (Hartig et al., 2010; Vieira Pak & Castillo Brieva, 2010). By integrating existing knowledge and stakeholders' perspectives, such simulation approaches have proved to be efficient in crossing disciplinary boundaries and understanding systems' complexity. However scenarios and models are often based on consensus or established knowledge. Considering that the design of innovative farming systems requires interplay between exploitation of existing knowledge and exploration of innovative futures (March, 1991), we question the relevance of simulation approaches to go beyond incremental innovation.

In this paper, we compare participative methods such as the Forage Rummy (Martin et al, 2011) and the Companion Modelling approach (Etienne, 2011) with a method based on C-K theory (Hatchuel & Weil, 2009), developed in the industrial sector to manage collective exploration for radical innovation. As organisers and observers of design workshops using these methods, we analyse for each of them how existing and induced knowledge is managed and gaps are identified, how conceptual exploration is conducted, and how relations between participants are taken into account. Finally, we discuss how these methods could be combined to foster radical innovation in the field of farming system design.

Key lessons from a cross-analysis of innovation experiences in Africa

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Within the context of the FP7 JOLISAA project (JOint Learning in and about Innovation Systems in African Agriculture), an inventory of innovation experiences was developed covering three African countries: Kenya, South Africa and Benin, and focusing on diverse innovation experiences in which at least 3 different types of stakeholders were involved, and being at least three years old. The inventory was made according to a common analytical framework and guidelines to ensure cross-comparison across cases and countries. The inventory consists of two interrelated templates: (1) an MS Excel © template which covers semi-qualitative characteristics, and (2) a MS Word © template, which offers a short qualitative description. National teams used two major avenues to identify cases: literature searches and interactions with a range of institutions and networks engaged in agricultural innovation. Interviews with resource persons and field visits were also conducted to supplement the available / accessible documentation. The completed inventory includes 50 documented cases, covering a wide diversity of experiences, including different types, domains, scales and timelines of innovation, with different degrees of success or impact in terms of improving smallholder-livelihoods. The 50 cases share a number of key features: the common occurrence of "innovation bundles" (a combination of technological, social and/or institutional innovation); the non-linearity of the innovation process; the strategic importance of market linkages in triggering or driving many of the innovations; and a usually close relationship between innovation and externally-funded projects. NAtional terams faced several challenges during the inventory process, including a proper understanding and consistent use of key innovaiton-related concepts.

Facilitating agricultural innovation in vicious non-systemic development circles: Lessons from agricultural development projects

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Enormous changes have been taking place in theory and conducts of agricultural extension in developing countries because of the rapidly evolving nature of agricultural innovation. These changes require new ways of conducting extension activities that involve facilitation of interactive communication among multiple stakeholders and a wide range of intermediation tasks within (and between) stakeholders operating in different social speheres. More so, key extension stakeholders need to deepen their understanding about innovation that goes beyond informaiton and knowledge disseminaiton to a process of embedding new knowledge into social and economic changes. This has led to recognizing that extension stakeholders require new capacities as individuals, organizations and systems. In the new agricultural innovation landscape, how is conventional role of extension being reinvented in rural areas, especially among those people primarily dependent on smallholder agriculture? Drawing on lessons from several projects we intend to discuss current extension institutional functions and associated barriers in achieving performance of innovation systems and collective actions. The findings of this study suggest that agricultural extension projects still miss the opportunity to deliver extension services as collective and systemic functions. We argue that this is due to institutions that curb the agricultural innovation system function within the linear paradigm of technology transfer, under-estimation and depreciation of intermediary roles of extension personnel (e.g. brokering, negotiating, convening), and inability to foresee facilitation of learning in conjuction with institutional adaptation process. We conclude that effective functioning of agricultural innovation

system should address an evolutionary process of capacity development which synchronizes required changes in the roles of individuals and organizations within a project context.

Structural conditions for dynamic innovation networks: a review of eight European Agricultural Knowledge and Innovation Systems

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The relationship between collective stakeholder actions, social learning and rural innovation has become one of the pillars to work on radical transitions towards a more sustainable agricultural sector. It has become more and more recognized that many innovations are the result of intersectoral collaborations within flexible and dynamic innovation networks. In these networks, joint (or social) learning and negotiation takes place between different types of actors in processes of knowledge co-creation.

However creating and fostering effective linkages among heterogeneous sets of actors is far from easy and is often hindered by different technological, social, economic and cultural divides. Such divides may be caused, for example, by different incentive systems for public and private actors, differences between local indigenous knowledge systems and formal scientific knowledge systems, social and cultural differences that cause exclusion of certain actors and ideological differences.
In this paper we investigate the organisation and functioning of the formal AKS and how it can support or inhibit innovative bottom-up approaches to knowledge co-creation and social/joint learning.

The paper will present a comparative analysis of the different types of arrangements of the Agricultural Knowledge Systems within eight different European countries (England, France, Germany, Hungary, Italy, Latvia, the Netherlands and Switzerland). We have investigated how the main actors interact within their respective innovation systems and how they are influenced by various institutional characteristics. Using an Innovation System Performance (ISP) matrix (Klein Woolthuis et al., 2005; van Mierlo et al., 2010) the main enablers and barriers with regard to collective action have been categorized.

Results thus show how these institutional determinants can both support or inhibit joint learning and bottom-up innovation projects.

Assessing the impact of uncertainty in automatic milking innovation systems - an international perspective

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The use of automatic milking systems (AMS) is in an emergent phase in Australia with approximately 15 farms using the system in 2011. Dairy Australia, an industry-good research and development organisation, has acknowledged a future role for this technology in the Australian dairy industry. However, successful uptake of automatic milking relies on farming system adaptation and existence of appropriate technological, social, and institutional system configuration.

An online survey of 85 AMS researchers and service providers was conducted internationally, followed by case studies of non-farmer experts in selected AMS markets (The Netherlands, Denmark, England, Ireland). Results from the online survey were used to form a basis for the semi-structured interview questions in the case studies. An innovation systems framework was used to analyse the results, with particular attention to the mediation of technological learning through structures and initiatives which reduce uncertainty associated with the innovation.

We found that roles in the international AMS innovation systems differed through time, with larger roles for research and industry-good early in the innovation system development. Technological uncertainty played a major role in adoption initially along with some impact of political uncertainty. Knowledge development was originally focused around farmers and technology providers, but later there were important (and commercial) roles for knowledge brokers.

We use the findings to suggest a framework for the Australian dairy industry in respect to reducing uncertainty in the medium-term development of a successful AMS innovation system. There is an immediate need for institutional guidance to foster knowledge development and exchange and to establish a foundation for ongoing capability development. We also provide reflection on the use of an uncertainty framework for guiding industry response to high challenge technologies.

Increasing the efficacy of public support for collective learning in rural regions

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Successful regional development approaches place learning and innovation at their centre. The efficacy with which support for collective learning is provided, however, is often questionable because it does not address the high diversity of actors and activities contributing to regional development in rural areas. This paper attempts to address the question: 'how can the efficacy of support for collective learning in rural regions be increased?'. Within the EU-funded project DERREG research was carried out with 10-15 supporters and beneficiaries in six European case study areas, using semi-structured interviews and discussion rounds. The results indicate that to increase the efficacy of public support three dimensions need to be considered: the scope of operation (i.e. the type of beneficiaries targeted and geographical position), the formal shaping of the operational space (i.e. the type of support and facilitation provided, rules, regulations and procedures attached to obtaining it, and the resulting shape), and the delegation of tasks and roles to operational agents and agencies. A well-balanced, regionally differentiated mix of these three dimensions is necessary to increase the efficacy of support collective learning in rural regions successfully.

The dynamics of designs as boundary objects in agricultural innovation projects: an explorative study

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The purpose of this paper is to investigate the function of the written, visual and tangible expressions of designs as boundary objects in innovation processes. Through a case study analysis of the innovation process that led to the establishment of the Rondeel poultry husbandry system, the functions of designs as boundary objects in creating mutual understanding among diverse actors in innovation processes and mobilizing support for innovations are clearly revealed. However, the design as boundary object is not a fixed end-product: it is constantly reinterpreted, acting both as an inclusion and exclusion device for actors and options in the innovation process. The results confirm that a design can be purposefully created to serve as boundary object, but that continuous attention is needed to ensure that its positive impact on the innovation process is maintained : the boundary object in itself does not necessarily provide these process conditions and its effectiveness cannot be predicted.

Communities of practice as an analytical approach to understanding decision making on multifunctional aspects on Danish dairy farms

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In Danish dairy farming the use of summer grazing for dairy cows is decreasing in these years. Most dairy farmers acknowledge that there is a public demand for the multifunctional aspects of grazing but nevertheless an increasing number of farmers keep the cows stabled all year round. Economic arguments are often used to justify this decision but most often these arguments are not in accordance with the economic realities. An earlier study based on the theory of communities of practice has shown that the work-related micro-level social interaction on the individual farm is pivotal for change in accordance with public demand for compliance with environmental targets. This might also be the case for the decision on use of grazing on dairy farms. On the empirical basis of interviews and participant observations on Danish dairy farms and drawing on the theory of communities of practices as an analytical framework, this paper analyses the relational preconditions for decision making in the micro-level social collaboration around the farmer and the work on the farm.

Facilitated Networks and Beyond: Policy instruments for agricultural innovation

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The innovation systems literature emphasises the importance of networks for agricultural innovation. Networks offer governments new opportunities to stimulate agricultural innovation. As a policy instrument, a so-called facilitated network often takes the form of a project, the goals of which include or entail the formation of new networks or the strengthening of existing networks. We report on an exploratory study comparing the effectiveness of facilitated networks to other policy instruments for agricultural innovation in the Netherlands.

We conducted semi-structured interviews with ten experts on networks and innovation. Policy alternatives to networks they named included research funding, innovation experiments, knowledge vouchers for entrepreneurs, practice networks, competitions for awards / prizes, innovation subsidies for individual entrepreneurs, legal exceptions, legislation and fiscalisation.

In the early stages of innovation, facilitated networks were seen as more effective and cost-efficient than the other instruments. This was especially the case for system transformation. However, other instruments can have comparable performance for innovation when they result in sufficient network formation. This can be achieved by implementing those instruments in ways that require the target groups to build coalitions and other forms of networks. Network formation was evidently seen as an important factor in the facilitation of innovation. Networks were also seen as effective for system optimisation, but not more cost-efficient than other effective instruments.

Finally, past policy experiences enable moving beyond the generic term of "(facilitated) network" to develop more advanced instruments for specific types and phases of innovation. An example in case would be to combine instruments such as research funding, innovation experiments and exceptions in legislation to better support invention and business case development for system transformation.

Landscapes of practices, social learning systems and rural innovation

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Wenger (1998) claimed that "the learning and innovation potential of a social learning system lies in its configuration of strong core practices and active boundary processes". Wenger has more recently further developed the related concept of a 'landscape of practices' (Wenger 2010) which has been found to be meaningful by some Open University students working towards their Masters qualifications in Systems Thinking in Practice. These students have used skills developed in systems thinking to review their future trajectories, not just within one or two communities of practice but across boundaries. This paper will draw on insights from Wenger and from the Open University's recent work on social learning systems and managing systemic change to consider landscapes of practices of relevance to rural innovation. It will review some of the core practices and boundary processes of communities engaged in farming, forestry, rural development and research and how their learning and innovation potential might be enhanced or constrained.

The Emergence of an "Organic" Human-Nature Relationship

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There is evidence that the human-nature-relationship of organic farmers, expressed through their doings and sayings, differs from that of non-organic farmers. However what might be the deeper background and the specific characteristics of this relationship? We argue, that the interplay between human and nature is driven by an ongoing systemic transformation process, which could be explained through system dynamics.We apply the term transformation instead of innovation, arguing that transformation has not been overused as the term „innovation" has through commercialization.

To prove our hypothesis, we studied how organic farmers reflect, express and practice their transformation processes towards their individual human-nature relationship. To do so, we established four farmer focus groups with a total of 26 farmers in the Midwestern region of the US.

Resulting from our farmer focus groups, we argue that systems thinking and practicing, e.g. the awareness of the interplay and characteristics of different systems (e.g. the social, the natural, the technical or the economic system), the openness for reflexive learning processes and the non-linear worldview of organic farmers are fundamental for their individual human-nature relationship.

Green innovation – co-learning and conflict resolution

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In this paper we look at innovation systems in relation to ecosystem services, including in particular innovations in the governance of ecosystems, and how this affects the processes of innovation in a local (rural) context. We take the learning approach to innovation and innovation systems (Lundvall, 1992) because we consider this to be the most valid approach to the kind of "green" issues we are working with, in particular food, water, waste and renewable energy.

In a system dynamics approach, ecosystem services under certain circumstances flow from natural capital just as human services flow from the stock of human capital. If a capital depreciates then

ceteris paribus the flows from it decrease. If these services are recognised by humans or human institutions they can increase human wellbeing and/or economic activities. The green economy approach currently favored by the European Union as well as the OECD introduces the challenge of solving environmental problems while simultaneously creating economic benefits and human welfare.

The management of many natural resources today is either driven by the need to reduce pollution as in the Water Framework Directive, or by the economic returns from the natural resource like food production. The idea of the green economy is to find win-win solutions that resolve conflicts between economy and environment for the benefit of all. Reaching this goal demands an innovative approach to governance at local levels, as well as to product innovations.

We will present two examples of innovative approaches to governance, which led to simultaneous economic and environmental gains in rural areas.

- The Morsa Water Area in Norway exemplifies how good governance can bridge the gaps between stakeholders. Historically conflicts existed between those who are affected by pollution problems and those that are affected by mitigation. Through bottom-up processes, stakeholder involvement, an agreed scientific status and knowledge building the freshwater now again is a regained recreational and a useful source for agriculture and industry.
- The Windmill example from Denmark shows how 'well-thought' institutional regimes for an ecosystem service can create economic success. Through a process with policy instrumentation for supply, demand, local ownership, social acceptance and R&D the result is a wide distribution of economic benefits and wind turbine production as one of Denmark's largest export industry.

A 'learning system design' for more effective agricultural research for development

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A 'learning system' design is described and critically examined as an approach to integrated agricultural research for development (R4D). This learning system sits within the monitoring and evaluation (M&E) component of an Australian research initiative to improve food security across sub-Saharan Africa. This program (Africa Food Security Initiative [AFSI]) is one component of Australia's development assistance program in Africa and focuses on building capacity to increase agricultural productivity and food and nutritional security by boosting African science leadership, skills, networks and institutions. The 'learning system' design addresses the research question: Can a learning system be designed in AFSI such that reflexive and responsible research for development (R4D) practice is an emergent outcome? It also supports formal M&E by: (i) elaborating the multiple pathways for impact and the associated indicators of impact for the range of project interventions; (ii) further elucidating the qualitative and quantitative data to be collected and appropriate platforms and processes for joint data management, in order to provide content for AFSI reports and review processes as well as co-produced scientific publications; (iii) assistance to AFSI researchers in undertaking systemic action research in the context of their AFSI activities; and (iv) enabling the linking of evaluation data and theory in scientific papers which are contextualized for the current state of thinking in the field of R4D. Emergent outcomes to date that support design effectiveness and efficacy are reported; the wider applicability of the approach to the systemic design of appropriate innovation platforms in R4D is discussed.

Transforming Roles of Public Extension to Strengthen Innovation: Lessons from Bangladesh

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The rapidly evolving nature of agricultural innovation processes in developing countries requires agricultural extension to make necessary transformations of classical roles that previously supported linear knowledge circulation and adoption. New ways of conducting extension activities are emerging that involve facilitation of interactive communication among multiple stakeholders and a wide range of intermediation tasks within (and between) stakeholders operating in different social spheres. Drawing on lessons from an agricultural extension for development project in Bangladesh we examine whether and how the public-sector agricultural extension agency has transformed its roles in order to strengthen agricultural innovaion as an outcome of effective functioning of innovation systems and collective actions. The findings suggest that agricultural extension projects miss the opportunity to deliver extension services as collective and systemic functions. We argue that this is due to institutions that curb the agricultural innovation system function within the linear paradigm of technology transfer, under-estimation and depreciation of intermediary roles of extension personnel (e.g. brokering, negotiating, convening), and inability to foresee 'extension methods (e.g. training, demonstration)' as facilitation of learning and knowledge embedding processes.

Convenors:
Thomas Aenis, Andrea Knierim, Otto Kaufmann, Jutta Zeitz, Frank Ellmer and Johann Bachinger

Adaptation of farming systems to the impacts of climate change is a crucial issue in future, in Europe and worldwide. Technological and biological innovations are needed which render land use more risk resistant and resilient. New organizational and institutional models at both farm and knowledge system level might become necessary to strengthen appropriate innovation generation. The workshop invites particularly the presentation of interdisciplinary case studies and best practices.

Viticultural strategies to adapt to climate change: Temporal and spatial changes in land use and crop practices

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Grapevine is a perennial crop, remaining economically productive for more than fifty years. Site selection and perennial crop practices have to be decided before planting. Then, annual crop practices are continuously required to adapt to the weather conditions of each growing season. The economic implications of global warming on viticultural sustainability signify consequently that adaptations of perennial practices should be anticipated. The Loire Valley is a northern latitude French wine region, characterized with a rather short growing season from April to September. The earliness of the grapevine growth cycle and ripening period are essential factors assuring the production of quality wine. They are mainly influenced by the local climate. However, soil properties, such as soil depth, soil temperature and moisture, allow viticultural strategies to adapt to the constrained climate conditions. Simulated future climate scenarios for the Loire Valley illustrate that sites with low water holding capacities may suffer from a greater water constraint, which will reduce yield and influence berry composition. The increase in temperature means also that during warm growing seasons, grapes will reach maturity too early when climate conditions are not optimal for grape ripening. In the Loire Valley, a method has been developed at plot scale to characterize the environmental factors and predict the main variables influencing vine development and berry composition: earliness of the vine cycle, water supply and vine vigor. This method will allow viticultural strategies to adapt to climate change at different temporal scales: modified annual crop practices in the short term, selecting sites with higher water reserves in the medium term and planting new varieties after the mid-century.

Assessing the Vulnerability of Organic Farming Systems - A Case Study from the Federal State of Brandenburg, Germany

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Impacts of climate change on agriculture have been predominantly analysed by using biophysical and crop specific model applications. Vulnerability assessments which identify the vulnerability of regions with their farming systems are urgently required, because agricultural adaptations to climate change are related to regional specifics, and therefore research has to consider include the regional level. Therefore sector- and system-specific approaches have to be developed. This paper presents the methodology of a vulnerability assessment for organic farming systems in the Brandenburg Region, which considers regional-specific climatic impact, as well as the regional-specific adaptive capacity. In this region, the cultivation and management of legume-grass swards have a key position, especially the climate change impact on legume symbiotic nitrogen fixation and nitrogen mineralization. Adaptation strategies of crop production systems include reduced soil tillage, which plays an important role also in organic

farming systems (reducing soil erosion, improving water infiltration, reducing evaporation and improving soil structure, control of N-dynamics) are developed and tested by means of an action research approach.

Soil conservation techniques for climate change adaptation among arable crop farmers in southwest Nigeria

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Agriculture places a heavy burden on the land and environment in the process of providing food for man, and climate factors in agricultural production is having its toll on soil fertility in rural Nigeria. The study explored farmers' awareness and practice on soil conservation techniques for climate change adaptation in southwest Nigeria. In the event of reducing yield, flooding and increasing soil temperature, farmers have resorted to adaptive strategies to reduce the effect of climate change. A sample 102 arable crop farmers producing major staple food, were selected and interviewed. Majority (81.4 %) of the sample is male and 54.9 % fell within the age category of 31-50 years. Over half (80.6 %) of the farmers had formal education. Also, 60.8% of the farmers cultivated about 1-3 ha of land and had about 10years of farming experience. The common climate adaptation strategies among the farmers were mulching, green and farmyard manuring, cover crops and mixed cropping, which have direct effect on soil nutrient. Other strategies to mitigate the effect of flooding such as terracing and contouring were used seldomly. Farmers' opinion towards climate adaptation strategies is that no significant yield increase was achieved and the techniques were not cost-effective. Also, the techniques require technical know-how, which they lacked. Major constraints to farmers' use of the climate adaptation strategies were pressure on land, lack of knowledge on soil conservation techniques, inadequate information and education on use of soil conservation techniques and insecure land tenure system. Significant relationship ($p<0.05$) existed between use of the strategies and educational level ($\chi 2 = 15.603$) and age ($r=0.217$). There is the need for increased knowledge on climatic adaptation and educational orientation for technical know-how. Strengthening agricultural extension services will make farmers more informed and knowledgeable about climate change impact on agricultural production.

Participatory design of livestock systems adapted to new climatic conditions

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Climate change progressively makes obsolete the current agricultural production strategies built with respect to previous landmarks of average and extreme climatic situations. In order to remain viable in the expected climatic context farming systems will need to evolve both in their structure and management. Because farmers and extension services are the primary actors in agricultural production they have to be involved in the process of designing adequate renewed systems. However, the complexity of most design approaches produced by research (e.g. based on computer models) prevents them from deep involvement in such design projects. This paper presents a game-based design approach developed to foster the involvement of farmers and extension services in the design and evaluation of livestock systems. The game, called "forage rummy", relies on a number of "boundary objects" that put relevant pieces of scientific knowledge in a more understandable and tractable form for the design task. These are a player-friendly game board in which sticks representing year-round forage production and animal feeding requirements have to be assembled. Playing the game consists in iterating tentative configurations of a livestock herd (production goal, size), the grassland resources

(types of grass and associated area and usage), and feeding diet along a 12 month cycle in a given economic and climatic scenarios. The generation and evaluation of each configuration are done collectively in a participatory workshop and exploit a simple balance model. A diversity of use is permitted by this game depending on the matter being discussed. The paper describes its use in the design of dairy systems adapted to climate variability and change expected by 2050. From our experience with the forage rummy, we synthesise lessons about key factors enhancing participation, focus and depth of discussion, and learning about the relevance of potential farming systems adaptations.

Development of Agricultural Innovations in Organic Agriculture to adapt to Climate Change – Results from a Transdisciplinary R&D Project in North-Eastern Germany

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Based on concepts for innovation processes and co-production of knowledge, approaches are searched to address the urgent and complex problems related to climate change, where especially the participation of and close collaboration with practice partners is claimed. The paper presents the agricultural knowledge management approach in the module on organic agriculture in the R&D project INKA BB (Innovation Network for Climate Change Adaptation Brandenburg Berlin) in north-eastern Germany (Knierim et al. 2009). The methodology for the science-practice collaboration follows an action research approach that supports the communication and cooperation of researchers and practitioners. The framework is the action research cycle with the iterative stages of planning, action and reflection. The module on organic agriculture, where individual research questions are addressed on several farms, will be presented as a good practice example for close transdisciplinary network cooperation. The workshop contribution will provide insights in and reflections on the process of innovation development over two project years.

Farming Systems within Protected Areas and dealing with drought and elephant invasion: Climate change challenges in Limpopo National Park, Mozambique

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Drought and elephants are interconnected factors that determine food security in the Limpopo National Park (LNP) Multiple Use Zone (MUZ) communities. About 30.000 people inhabit the so called MUZ relying on rain fed agriculture for their livelihoods. The low and unpredictable rainfall pattern (320 to 450 mm year-1) under semi arid conditions, coupled with low input technology shape the main farming systems. Cropping in different locations, seeding at every rainfall event regardless of the season, mixed crops to ensure crop diversity and reduce crop failure risk are some of the adaptive strategies of MUZ communities to cope with recurrent drought events. The effectiveness of all the adopted strategies is further challenged by elephant invasion in the park setting, with consequent crop damage. This paper assesses how MUZ communities respond to drought and elephant pressure to overcome food insecurity. Participant observation, in-depth and semi-structured interviews, participatory mapping and a survey with 106 households were used to gather qualitative and quantitative data on socio-economic and seasonal livelihoods variations, between February 2008 and July 2009. Results show a positive relationship between droughts and crop damaged by elephants. The number of elephant raids increases with intensity and severity of drought, up to five or more invasions per cropped area. As a

consequence, 48.1% of households reduced the cropped area while 52% also decreased crop diversification, and therefore amplified their exposure to food insecurity due to the limited livelihood opportunities. The limited opportunities for diversifying MUZ livelihood and overcoming food insecurity call for urgent intervention to seek alternative Park management strategies. A systemic and action-oriented approach is proposed to work towards harmonizing people-wildlife coexistence.

Local Knowledge, Agents and Models for the adaptation to climatic variability of livestock farmers in Uruguay

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Basaltic soils in Uruguay occupy 3.5 million hectares, 25% of the country, and are mainly exploited by extensive family ranching production systems. These shallow soils have an extremely reduced capacity to accumulate water that make them more sensitive to drought with negative consequences in: forage production, animal production, feeding security, and high consequences on the economy and welfare of livestock farmers and the local communities living conditions, then on the whole beef supply chain and on national exports. Extreme events will be more frequent in the future as a consequence of current climatic changes. It is thus necessary to improve the adaptive capacities of the livestock producers.

In order to understand the past effects of droughts, we developed an interactive agent based simulation model and we compared two different farmers' archetypal strategies. The design of the model was conducted in four steps: 1) we simulated the grass growth using a logistic growth equation calibrated with data originated from the MODIS satellite, 2) the natural dynamic life cycle of the cattle was collectively designed, 3) we simulated the interaction between the grass and big grazers, 4) we designed different strategies of farm management, by using the information gathered in 8 workshops with the participation of 156 livestock farmers. Thus, we collectively examined the simulation results with livestock farmers and development actors. Now, we are constructing a "serious game" called "Ganaderos y sequía" that will be accessible in our web page. The purpose is to get a flight simulator like game that will speed farmers' learning and adaptation to droughts.

Adaptive strategies of cattle livestock farmers facing multiple uncertainties in a district of the Argentinian pampa

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In Argentina, livestock systems are faced with great uncertainty due to the financial crisis and to recent severe climatic events (e.g. drought in 2008-2009). In such context, what are the different production strategies and adaptations which livestock systems develop in front of climatic uncertainties and variability of meat prices and in particular, what is the role of resources (food and capital or labour) used by farming systems to adapt?

Our study aims at investigating how agroecological production systems grounded on natural pastures adapt themselves to multiple uncertainties. Choosing this focus, our central hypothesis is that these pastures may play an important role in the flexibility and sustainability of these production systems faced with severe climatic changes. Our objective is then to investigate how the use and the management of pastures contribute through time to endow production systems with adaptive capacities to face climatic crisis.

Within a joint Argentinian-French cooperation program, our study was undertaken in Magdalena district (south-east of La Plata, province of Buenos Aires), which is part of the humid Pampa and where various types of agriculture (financial as well as family ones) coexist. As a conceptual basis, we

chose a functional viewpoint on farming systems acknowledging the complex nature of these socio-technical systems. Data were collected within family farms with a comprehensive procedure (semi-directive interviews with farmers) allowing us to characterize in deep farm trajectory, feeding system and reactions to severe climatic crisis. We illustrate the preliminary results of this on-going study with illustrative case studies of family farms in Magdalena district.

Adaptation process of farming systems in response to 14 successive years of drought in North West Coastal Zone (Egypt)

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The Coastal Zone of Western Desert, Egypt (CZWD) is historically a pastoral zone, and the raising of livestock is the main socioeconomic activity. The zone has witnessed major changes over the last 50 years; demographic growth, urbanization, touristic development and agro-ecological diversification. More recently, the zone has faced a long drought period from 1995 to 2011, with low erratic rainfall (< 150 mm). Scarcity of rainfall has affected farming systems and household livelihood. The Bedouin societies have diversified their farming systems, based on livestock, barley and fruit trees.

The study analyzes the impacts of this long drought period on the livestock farming systems, and the adaptive processes developed by breeders to cope with it. The analysis is based on household surveys (182 families surveyed between April and July 2011) in three agro-climatic regions of the CZWD: the rainfed region (West), the new reclaimed lands (East) and Siwa desert Oasis.

The role of small ruminants differs accordingly to the agro-ecological region. In the dry rainfed region (West), flock size decreased from 244 to 152 heads, over the drought period from 1995 to 2011, where it is increase from 161 to 234 in the new reclaimed lands (East), with the availability of green fodder and crop residuals. The animal reproductive performance as lamb born/ewe/year differs with the agro-ecological region being better in the new reclaimed lands. In the rainfed region, breeders have developed different adaptive mechanisms such as, decreasing flock size, raising more goats, relying more on concentrate feeding and early marketing of their lambs/kids. Migration of family members to agro-pastoral and urban areas was another social coping mechanism to the long drought. Long drought duration have induced detectable diversification of farming activities in the area.

How would Farmers in the French Alps Adapt their Systems to Different Drought and Socio-economic Context Scenarios?

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The French Alps are considered as an area that is particularly vulnerable to climate change. Several droughts have already occurred since 2003. In order to assess the ability of farming systems to adapt to future drought events, we developed prospective scenarios combining different climatic and socio-economic contexts. Four scenarios were defined based on (i) prospective studies conducted at national and international levels, and (ii) a participatory approach with various stakeholders to transcribe these scenarios at a local level. Farmers and shepherds in the Vercors and Oisans massifs were surveyed in order to understand how they had reacted to previous droughts, and how they would plan to react to our scenarios. Results show first that the farmers would strive to continue their activity in each scenario, taking advantage of the flexibility of their farming systems, as in previous years. However, in the most pessimistic climatic scenario, they would also decrease the size of their herds. Depending on the socio-economic hypothesis, they would adopt farm structural changes (farm processing activities, direct selling, etc.), or look for part-time non-agricultural jobs. Three types of strategies were identified,

depending on the farmers' objectives and adjustments. Finally, public policies to accompany these changes are considered.

Several animal species in the same farm: is that a system from the past or an innovation for the future, face to uncertainty?

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The climatic changes which regularly undergo the breeders bring the researchers to analyse the configurations of breeding systems allowing to reduce their sensibility to the disturbances of the environment.

The diversity of animals constituting the herd, allowed by the association of two species of ruminant animals on the same farm, is a track of research, assuming it allows flexibility, adjustments in the use of available resources, thanks to the different and complementary capacities from every animal category, especially for the land use. The management by the breeder of competitions and complementarities existing between two herds of different species, in the particular case of our study, dairy cows and meat sheep, thus appears as particularly interesting to analyze.

Inquiries with eighteen mixed farms breeding dairy cows and meat sheep of Massif Central were realized. They were used as a basis to the construction of a typology of functioning, which reports interactions between animal diversity (species and batches) and variety of the available resources, on which the breeder can act and which are a source of flexibility for his system.

Four logics of functioning were identified and characterized. These logics fairly differ on the spatial configuration of grazing and on the level of intensification of surfaces.

Convenor:
Ruth Nettle

In part, sustainability in farming relies on people willing to work or invest in farming land or in farming operations. There are different pathways for people to enter and exit farming. Globally, the systems of transitions in farming are changing. Land prices, agricultural investment markets, new generations' motivation to farm, growing urbanisation and expanding scale of farming are influencing the pathways and possibilities for people to enter, stay or exit farming. It is timely to explore the issues associated with these changes and the responses and emerging innovation.

Social isolation among young farmers in Quebec, Canada

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What is the social reality of young farmers? How, and to what extent, does emerging farmers' future in agriculture impact on their level of isolation and emotional lives? What are the characteristics of the social and professional networks of young farmers in Quebec and what are the characteristics of the social support? And more broadly, what is the impact of the social isolation on the maintenance and renewal of family farms? These are the questions that led us to conduct a survey completed by 407 young farmers. We present a typology of social contacts created by crossing data measuring the size of the social networks and the feeling of loneliness. Four categories are presented: the socially competent group (41%), the solitary group (27%), the socially inhibited group (16%), and the last, most problematic, the socially isolated group, composed of the 15% of young farmers who, in addition to having a small social network, have a strong feeling of loneliness. We note that social isolation is related, among others, with the level of education, the single-couple situation, the relations with neighbors and the number of working hours. We also noted that social isolation does not necessarily mean geographically far apart.

Understanding the diversity of farms' pathways as a co-evolution between family organisations and farming system pathways: a framework

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Despite important changes in the French agricultural world over the past 6 decades, agriculture remains family-based. Thus the operation of the farm remains organically linked to family's functioning, so that the family organisation and its evolution both imply choices and compromises on the way the farm is managed and on everyone's position on and off the farm. Reciprocally the farm management has consequences on the family and on people's life paths. Whereas Rural Sociology has focused on family arrangements on the farms, Agricultural sciences propose theories to analyse the farms' functioning. For that reason, it is a real challenge to link within a holistic understanding the farms' and the families' functioning. To qualify long term co-evolution of family and farm over a generation, we propose an analysis framework of the articulation between family and farm, based on 7 case studies conducted on dairy cattle farms in Vercors (a mountain area, France). In each farm, we carried out interviews with each family member working on the farm. That allowed us to grasp the diversity of representations within families and to reconstitute the farms' structural, technical, and commercial pathway. Using the two concepts of descent group and domestic group borrowed from the Anthropology of kinship, we explore the various impacts that property and skills transmission have on farms' pathways (ranging

from a structural and functional stability of the farm to its radical change). We also investigate the role of individual emancipation within the family on the farms' evolutions. Our first results suggest a large diversity of ways of being a farm family, ways of being that don't have the same consequences on farm management and on its pathway. We show inversely how the family's and farming system's history can have more or less influence on people. Even in farms which are legally designed to keep the family at distance, it is never absent and deeply impacts the farm pathway.

Farmers growing farmers: The role of employment practices in reproducing dairy farming in Australia

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As farm sizes become larger, as the farm ownership profile ages and land ownership becomes more concentrated in many developed nations, there is increased reliance on employed labour on both family- and corporate-owned farms. The relative attractiveness of farms as workplaces then becomes of increased focus for retaining people in farming and for the sustainability of farming. How do 'progressive' employers create attractive workplaces and how does this influence the production and reproduction of farming systems? This paper reports on a study of farm workplace practice and employee experiences of work in the Australian dairy industry. Case study farms were selected to understand the lived experience of employers and their employees in undertaking their farm work and how (if at all) employees progressed careers in farming. Employer strategies in farm employment emerged as an extension of their farming worldview, which engaged like-minded employees in rewarding work or in considering farming as a business proposition. Drawing on interpretive theories of work organisation, farm employment relations can therefore be considered to be a platform for the reproduction of dairyfarming outside the established norms of inter-generational transfer. The perpetual interpretive action that makes up farm employment relations is thus a negotiation for the sustainability of farming and also a trigger for modifications in farming systems. There has been limited focus by farming systems researchers on the role of farm employment relations in the negotiation of sustainabilities and the future of farming. A renewed focus toward the human and social dimensions of work organisation in farming systems is suggested.

Localised Agro-Food Systems in France and Dairy Farms performances

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In France, the dairy sector within the mountain areas turned strongly to a strategy of cheese production under quality signal like Protected Designation of Origin (PDO). Despite this strategy of differentiation, two strong disparities exist in the dairy farms in France over a long time: One concerns the Agricultural Income differential per dairy farm (profit before tax), close to 10 000 € per year; the other -linked to the previous disparity- concerns the renewal in agriculture. Farmers are getting older and fewer young people are entering farming. The objective of this paper is to shed light on the impact of a collective action and a substantial Gross Output to the farms' economic and social performances. We scrutinized two contrasted cases studies. For the first one (PDO Cantal), few firms have taken control on the supply chain and have chosen with the time a model based on costs leadership, imposing low milk price at farm gate. The second one (PDO Comté) is a specific model with a strong and structured collective action. We show that these two models have an impact on the dairy farms economic and social performance. Indeed, for the PDO Comté case, some business companies (farmers

and their cooperatives which are agro-food processing firms), related within a localised agro-food system in Jura Mountain, have achieved to control for the better the rules which govern the PDO cheese production chain. This collective action in Jura Mountain and its market power benefit to farmers thanks to the better milk price at farm gate than in others mountain areas. Thanks to data FADN (survey concerning European Network for farm accountancy) and data from the French Agricultural Census 2010, we bring to light the main factors of explanations of the highest economic and social performance of the dairy farms. The substantial Agricultural Income per farm is due to the substantial Gross Output. This extra Gross Output is partly saved:

- to increase the farm size and to organise regrouping of lands;
- to increase the herd and therefore the production;
- to develop technologies and assets.

These numerous actions have strongly carried farmers to develop new skills, to increase the labour productivity and to ensure greater the renewal in dairy farms. This evolution has begun for few decades.

Will farm leasing change rural communities?: Farming practices and community sustainability implications in an Australian dairy region

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Some actors in the Australian dairy industry see farm leasing as one way of meeting the current challenges of intergenerational transfer of farm businesses, but such a change in business models can be expected to change aspects of farmers' practices that impact on local communities, economies and environments. Previous research has found that farmers who do not intend to hand their farm over to their children are less likely to adopt practices aimed at long-term sustainable use of natural resources (Barr & Cary, 2000), but the impact of leasehold tenure on farmers' contributions to the economies and social life of local communities has not been studied. The broader literature on the social construction of farm practices suggests that they emerge from the complex interplay of many personal, social and structural factors, which are related also to the particular nature of the production system itself. How do these factors change with a move to leasehold tenure? Here we begin an exploration of this question by examining data from focus group discussions carried out with dairy farmers in the Alpine Valleys region of north-east Victoria, Australia. A key finding is that there are many opportunities for various actors to influence the practices of leasehold farmers, and thus to influence the changes to local communities, economies and environments that might be associated with an increased incidence of farm leasing.

Convenors:
Cristina Micheloni and John E. Hermansen

Family farms all over the world are the basis of food production and security and at the same time have all the potentials to offer the environmental services society demands from farming. They are also strategic elements in rural community maintenance. Nevertheless in order to be sustainable also in economic terms and able to grant a professional future to family farmers they need to restructure their mode of organization, taking into consideration the global structural changes of the agriculture sector and also implementing innovative tools and strategies offered by science.

How family farms in the Shropshire Hills are adapting to agricultural change: a transdisciplinary perspective

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Family farms in the Shropshire hills are important as food producers, but are also vital in maintaining the special landscapes of this area, as well as contributing to the rural economy and to local community development.. However, running an upland family farm to be economically sustainable in today's agricultural climate is challenging. Previous data collected for this area showed that: average incomes are low, there is an issue with succession as the average age of the farmer is 59, many farmers work very long hours without help in terms of time and labour, and there is an overall sense of isolation from the local community.

The paper presents a cross section of family farms in the Shropshire hills, examining how these farms have changed, or are planning to change, their mode of action in order to address the challenge of running an economically sustainable family farm. The paper looks at six farm case studies, examining their uptake of agri-environmental schemes and any changes in farm management that such schemes may have created, examples of diversification such as eco-tourism, links with local markets and consumers, and farm long-term financial viability.

Some of the case studies offer inspiring examples of innovative restructuring, while with others there may be an opportunity to consider further diversification options for the future. The paper will also discuss the ways in which these changes and innovations are being monitored and evaluated.

What are the strategies and steps to build-up a dairy system in a harsch environment? The case of familiar farmers of Unaí – Brazil

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In Unai, the products from familiar agriculture have a limited access to the local market, basically due to problems of amount and regularity in the delivery. Then the farmers adopt different strategies to adapt their production system to be inserted in an organized and competitive productive chain. The dairy sector is an opportunity to achieve this goal, and to be able to maintain their families on the farm. Inside of this reality, 24 familiar farmers of the city of Unaí (Minas Gerais, Brazil) that deliver milk for the local cooperative had been interviewed. The trajectories were then analysed. Despite that they all include an intensification and specialization process of the dairy production systems, they differ for many aspects: different strategies and sources of feeding in the dry periods; different breeds more or less adapted to the milk production; different sources of financial resources for investment in the production system; peaks of milk production in distinct periods, etc. This variability of trajectories is

linked to different practices to reach the objective to give security to the system, that is to say to decrease the vulnerability of the system face both to internal and external events.

Understanding and exploring the evolution of coffee-banana farming systems in Uganda

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In Uganda, coffee accounts for approximately 20% of total export revenue. For smallholder farmers coffee is a main source of income, extremely important to cover large costs such as school-fees for the children. A substantial proportion of the coffee farmers (37-88%) intercrop coffee with banana, which is one of Uganda's primary staple food crops. This practice is the result of local innovation.
Farmers' main reasons for intercropping coffee and banana are that (I) intercropping provides both food and cash from the same plot of land, (II) banana provides in-situ mulch and shade for the coffee, and (III) because land scarcity 'forces' farmers to intercrop. Recent research findings showed that coffee yields per hectare per year are not significantly affected by the coffee-banana intercrop system. Hence, incorporating banana in the coffee fields seems to improve food security without jeopardizing the coffee revenues.

A trend-analysis of coffee-farming systems in Eastern Uganda suggests that the ratio of intercropping has been increasing the past 5 years with currently more than 85% of the farmers having at least one plot with coffee- banana intercropped. Analysis at plot level indicates that almost 50% of former coffee mono- plots changed into coffee-banana intercrop plots in the same period. Despite these trends, around half of the coffee farmers in Central and Western Uganda still practice monocropping. In neighboring Rwanda and Burundi, the intercrop practice is generally discouraged by the local authorities. Although the advantages of intercropping seem obvious from an agronomic point of view, there may be socio-economic barriers to adoption at the farmer, extension and policy level.

We will present a research framework to identify and understand the past evolution in the farming systems of the East African coffee producing regions with the aim to explore opportunities and barriers of future development pathways for coffee smallholders.

Dynamics of livestock farming in extensive territories: what processes are going on?

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The dynamics of change in family livestock farming are crucial for the future of the extensive territories where they are located. Indeed livestock farming is an activity anchored in a society, with its market sectors and a local environment. It provides products and multiple services: social and economic dynamics, desirable landscape, biodiversity… Family livestock farming has to reshape itself, and face up to local factors of change such as demographic evolution or land pressure and global factors like climate or market. The purpose of our communication is to shed light on the processes of transformation of family livestock farming, based on a comparative analysis carried out on 8 extensive territories: 2 in South America, 1 in Sub-Saharan Africa, 2 in the Mediterranean area and 3 in the French mountains. Our analysis shows all the diversity in ways of farming, according to the mobilization of resources (land, labour, forage resources, animals..), the marketing of livestock products (processing, insertion in downstream sectors, using complementarities or causing tensions

between local and national/international markets), but also according to interactions with other activities in the territory (agriculture, tourism and residential habitat). We propose a cross analysis of the diversity of dynamics in family livestock farming within the territories, focusing on the following three points: i) management of forage resources and land use for feeding the cattle ii) marketing by assessing the balance between globalization of trade and territorialization, and iii) changes in the work carried out by livestock farmers.

Why they do that they do? A study of purpouses and strategic rules of Uruguayan's extensive beef farmers

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Farmers must make decisions that are taken by different criteria, which are in all cases personal and circumstantial. From a technical point of view, at the moment to propose any change in the farm structure, or any application of some particular technique -or even in the government policy making- is essential to know why a farm is like it is and why the farmers does what they does. To know the goals for which a farm operates seems to be a priority… viewed in the opposite way, to ignore the farmer's objectives can lead to make mistakes when planning any farm intervention programs. The objective of this study is to describe the main farmers Purposes (P) and which are the Strategic Rules (SR) associated, as they are defined by the Global Approach method. For this work a twenty study case farms were analyzed by two methods: Multivariate correspondence analysis and a text concept linking software (Redes2009). The results show that the most frequent P were: i) "Those relative to patrimony", ii) "Those relative to guarantee a money income", and iii) "Those relative to keep a rural way of life". The main SR associated to these P were, respectively, i) "To assure incomes" and "To keep herd as capital"; ii) "To manage work and family participation at farm tasks" and "To keep a comfortable way of life and life's quality"; and iii) "To assure incomes" and "To handle the indebtedness". The SR defined as "To assure incomes" was the most frequent, and it is strong related with two economical P (i and ii, staded above), and to others SR like "To reduce cost and money management" and "To handle internal and external information". In conclusion, the most frequently mentioned P was related to economic and social issues, linked with economic and social SR. The agro-ecological P per se was no present in this study.

The traditional extensive free range pig farm: a sustainable or an endangered production system

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The extensive Extensive pig production systems located in dehesa ecosystems (southwest rangelands of the southwestern Iberian Peninsula), are considered very important from several points of view. From an economic point of view, Iberian pig sector represents the 14.4% of Final Agricultural Production of the regions where they it is are located. From an ecological point of view, extensive systems are one of the main factors that contribute to the maintenance of the dehesa agrosilvopastoral ecosystem. Finally, from the social point of view, farms and producers also play an important role in the conservation and development of a less-favored area.

Nowadays, the sector is going through a structural crisis that is threatening the subsistence of many farms. The producers are making decisions that may affect the extensive traditional system of farming with the risk that it entails for the environment and for rural areas.

This paper analyzes the extensive pig farms located in Extremadura (SW Spain region), identifying the different types of farm and quantifying productive and commercial parameters that determine techno-economic results which are influencing its their sustainability.

Data collection was made by surveys conducted on site during 2010 and 2011 to owners and farm managers. Different indicators related to general characteristics of the farm, livestock numbers, buildings, machinery, labor, intermediate consumption, yields, product marketing and environmental management were analyzed. These indicators described the whole operation, and they allowed us to identify the best strategies adopted by farmers to adapt themselves to the current present sector market situation.

PerfEA: A methodological framework to help farm managers to build and manage a sustainable strategy in a participative way

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Farms evolve in a context characterized by uncertainties, changes of their legal, social and business environment. Thus it becomes difficult for farmers to set the course of their farm. We think that strategic management could be a relevant approach to help farmers to manage their farm and an important way to improve the global performance of the farms. To help farmers to formalize and to manage their strategy, we built an accompaniment methodological framework: PerfEA. This framework is constructed in order to take into consideration five main aspects:

- To affirm that strategic management is a relevant approach to help farmers to manage their farm in a more sustainable way.
- To introduce the systemic approach to help farmers to identify the sustainable process of their farm.
- To work with groups of farmers in a participative way to improve their perception of the stakes.
- To use the cognitive map approach to explicit and to discuss the farm performance.
- To endow farmers with a balance scorecard to manage the strategy.

The framework is organized in five steps: i) an in-depth analysis of the farm situation (including farm sustainability) and the organization aims; ii) formalization of the strategy by defining strategic lines; iii) drawing up the balance scorecard; iv) elaboration of an action plan, v) monitoring the implementation of the strategy. The link between the different steps is assured by the causal mapping.

A first test was done within seven educational farms. The framework has helped them to make and implement a plan for each farm. These farms were located in diversified geographical context. They have different production systems. Thanks to these diversified contexts the methodological framework is suitable for any kind of farm. Furthermore, it is adapting to be relevant also for agricultural firms. This last implementation has begun and seems successful. The framework is formalized as a guidebook. And we have developed a curriculum to train agriculture advisers, teachers or students to the farm management strategy.

Evolution of the production systems of the endangered cattle breed Mirandesa: Threats and alternatives for family-farm systems

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Family-farm systems are largely dominant in the rural communities of northeastern Portugal. Familiar farming systems can be organized based on the interrelations and the diversity of its characteristics such as farmer's age, farm dimension, external resources, productive orientation, or livestock type and number.

A significant number of the regional family-farm systems raise Mirandesa cows, a local cattle breed classified as endangered in 1994. Since 1995 the Mirandesa veal enjoys a Protected Designation of Origin (PDO) in northeastern Portugal. The carcasses of weaning calves, that aren't PDO, are currently paid 4 €/kg. The PDO producers receive 5,25€/Kg, a 31% higher premium price.
During the past 15 years, the number of family-farms decreased 64% (from 1465 in 1996 to 501 in 2008), and the number of breeding cows decreased 3.7% (4358 in 1996, to 4198 in 2008). The most resilient farms, practice a traditional production mode, with 3 to 10 cows average per farm. On these farms the gross margin for calf was in 1999, 50% higher than in more specialized farms (>10 cows). However, the number of more intensive is rapidly growing.

The PDO success is associated to the recent cereal prices collapse. It provided an opportunity to increase the livestock density and specialization in beef production, hanging the cow feeds on oat forage. A density of 0.3 - 0.5LSU/ha on the pasture areas, increased to 1.5-2LSU/ha. The intermediate consumptions of the production system, concentrated feeding, fertilizers and diesel had an inflation rate between 40% and 70%, in the period 2006-2011. These agriculture systems now give signs of rupture.
Competitiveness of the Mirandesa cattle production system in the future depends on the conversion of former cultivated areas into pastures and on the introduction of a new land management that promotes a higher cooperation/integration of the family-farm systems.

New Challenges for Family Farming Systems

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Family farming depends heavily on flexible and available family labour. During the last decades, though, sideline activities of farmers have considerably become more important in terms of income generation but also in terms of personal interests. Increasingly, the availability of family labour on farms is becoming a challenge for the farms.

In this study, focus has been put on the labour of women who still represent the largest proportion of (unpaid) family labour units in agriculture in Switzerland. If the labour of women decreases further in agriculture, what happens to our family farm systems? Is it realistic to go promote sustainable production systems without women?

The study draws on the comparative analysis of agricultural households with and without women on the data from Research Station ART's 3372 FADN farms, of which 182 (5%) are womanless households. Thereby it is important to state that the single male farmers are to be found in all of the farming zones in Switzerland, in the mountain regions as well as in the lowlands and they tend to be rather newcomers than drop-outs from agriculture: 45% of single male farmers are under forty years of age, and 81% are under fifty.

It shows differences between the farm managements between the farmers working together with and without women (partners, mothers) and looks at the overall ecological and economic consequences of this structural development in Switzerland.

Convenors:
Chris Kjeldsen, Markus Schermer and Henk Renting

'Alternative' food networks have emerged as promising approach for transitions towards sustainable food systems (in terms of environment, social equity and regional development). Many of these embody innovative forms of organization that help bridging the gap between producers and consumers. This workshop focuses on such new forms of collective engagement of consumers, producers and other actors as 'food citizens' within food networks. The aim is to better understand the associational mechanisms underlying 'civic food networks' and their impact on food and farming systems at different scales.

Austrian consumer-initiated alternative food networks – the case study speiselokal!

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During the last years, several consumer-initiated Alternative Food Networks (AFNs) emerged within Eastern Austria. Besides providing affordable local organic food of high quality, these initiatives aim to set up a closer relationship between consumers and producers. Furthermore, they support small scale, local, organic farming (worldwide) as well as new forms of civil engagement.

This paper provides a brief overview of Eastern Austrian consumer-initiated AFNs, mainly focusing on an initiative called 'SpeiseLokal!' that emerged recently in Lower Austria. SpeiseLokal is driven by the idea that local, organic food supply can only be sustainable and affordable by being embedded in new alternative ways of social and economic cooperation. Thus, apart from selling local organic food, SpeiseLokal! is engaged in alternative socio-economic network building, the re-localization and empowerment of people on a broader level. This paper reviews the practical experiences of Speiselokal! and reflects upon SpeiseLokal's relationship to, and its effects on the socio-ecological system it is part of (farmers, consumers, communities, nature, …):

SpeiseLokal! serves as a plattform were people who are interested in (local) food share their ideas and activities related to growing/eating/sourcing/distributing local food. Some of the consumers involved simply change their diet or start to exchange recipies, seeds and plants. There emerged initiatives that focus on community/guerilla gardening. Most recently - inspired and supported by SpeiseLokal! - farmers as well as consumers are working on setting up a network of community supported farms.

Quality beef in Denmark: What is quality? How does this definition of quality affect farming systems?

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Danes are some of the highest consumers of meat in Europe, yet the market is characterized by highly homogenous and standardized meat sold pre-packed in supermarkets.

Differentiated meat products and channels have been emerging (and disappearing) in the last decade. They are driven by different groups of actors relating to various value sets: citizens (animal welfare, landscape and biodiversity conservation), farmers (farm economy and animal welfare), artisan butchers (good handicraft), public authorities (biodiversity conservation).

In this paper we will look at 6 "alternative" beef meat food networks. The focus will be on their organization and negotiation around their values and how this impact on the communication from

farmers to consumers. We will also look at the consequences of it for the farm management and especially the inclusion or not of "nature care" grazing practices.

Does growth hurt? Resilience of farms in growing local organic food networks

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Marketing organic products locally with close consumer-producer relationships has been suggested to foster sustainable development of the food chain in numerous ways. However, the volume of products is small as well as the number of farmers and consumers involved. Also, there is a lack of knowledge on how farms are affected when local organic food networks grow in scale and output.

This paper presents preliminary findings of research exploring growing local organic food chains and how the farms in these chains are affected in terms of social-ecological resilience. Resilience is the capacity to deal successfully with change and is a systemic approach to the assessment of farming systems. Two cases are studied in-depth. The first case is an organic vegetable subscription system ("box-scheme") outside Vienna, Austria, and the second case is a farmer cooperative that created a label of organic, local beef in Uppland, Sweden. First results indicate that growth leads to changes and restructuring of the networks, influencing resilience and the relationship with consumers. In both cases there was an ambition to have direct contact and communication with end consumers, and growth of the networks influenced this ambition in different ways. In the Austrian case producers that could provide larger quantities became more important in the network and could therefore stay well in contact with end consumers. On the other hand, diversified and/or small-scale producers had to make an effort to find new connections with consumers. In the Swedish case, growth led to challenges in the wholesale part of the food chain. The butcheries used by the network could not deliver directly to the supermarkets, and the middleman who could, was not able to declare from what farm each piece of meat came. Thus, the label could not communicate with end consumers as well as the network would have liked.

Mirandesa meat PDO: The strategies of family-farm systems for their governance

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Mirandesa Meat, is one PDO (since 1995), that has for production region a small area from the northeast of Portugal far away from the great centers of consumption. The producers are 316, from which 180 formed a group producers (cooperative) that manages the PDO. All are organized in family-farm systems. Most, develop poli-cultural production systems, are retired or with multiple sources of income, and explore a small number of cows (average of 8 cows).

Over 90% of the production is sold in big population centres, with higher social stratification, localized more than 250Km from the production region.

With the consumers far away from the local production, the strategy of these producers after organized were based on three pillars: interactive communication through promotion and direct sales in fairs, progression in the value chain through product differentiation and valuing the certified dimension through the PDO and the recognition of Mirandesa meat derivatives like the example of Mirandesa sausage, a Slow food presidia.

The interactive communication between producers and consumers, in this context, becomes more vital as more distant producers and consumers are, once the latter lose direct control on the

production and sale of food. For small producers it's vital the utilization of different kinds of certification, because through their utilization they have the possibility to positively differentiate on the market.

The PDO Carne Mirandesa, has all it's production sold since 1998. In the year 2010 it sold 268t from 1960 carcasses. Nationally, it's the PDO that pays the highest value to producers (5.25€/Kg). In the production region, the carcasses of the same type that aren't PDO, are paid an average price of 4€/Kg, being observed a 31% difference.

The paper, analyses the strategy of approaching the producers and consumers by allowing the first a fair valuation of the product and the latter have more information and greater security in choice

Exploring the role of consumers as drivers of agri-food networks: contexts, beliefs, and governance

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The study suggests that governance of the short circuits is characterized by constitutional processes (Grandori, 2010) which are aimed at instituting polycentric systems. The analysis conceptualizes the food networks as contexts (Dilley, 2002) of systems of socio-economic relationships and recognizes that cultural constructs have a prominent role in the dynamics of the economic systems via the institutional dimensions and the collective action framed by policy. The context interaction is thus thought of as a driver of governance of the system of producers-consumers relationhsips. An empirical analysis is proposed which concerns with the governance of purchasing group organizations (GPOs). Four typical case studies (Seawright, Gerring, 2008) are proposed - GasTezio (Perugia, Central Italy), Gasp (Arezzo, Central Italy), BioAcquisti (Spoleto, Central Italy), Gas Ricorboli Solidale (Florence, Central Italy) - in order to corroborate the hypothesis that polycentric governance systems are achieved by through constitutional processes aimed at achieving a horizontal distribution of critical decisions rights (Gerring, 2004). The research questions are derived from the analytical framework and concern decision rights distribution among the participants of each. The case study constructs were developed in accordance with these research questions. Criteria for identifying case study typology were identified in parallel to constructs building (van Duren et al., 2003). Case studies are carried out by interviews and document analysis. The relationship between case studies and the theoretical hypothesis proposed is identified within the framework provided by Yin (1994). The analytical generalization method was applied, in which a previously developed theory is used as a template for comparing the empirical evidence from case studies (Yin, 1994, p.31) and in which results are generalized into theory.

Co-producing cultural coherency

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Since the 1960s, modernization en specialisation of agricultural food production caused and still causes a loss in the socio-economic and ecological performance of the rural as a productive natural resource base. From an agro-ecological departure point we study collective forms of food governance as ´laboratories' in which cultural coherency is co-produced between consumers and producers. More in particular, we analyse how initiatives of both producers and consumers contribute on the re-organisation of the relations between nature and society. In this paper we present the preliminary results of a survey held among newly emerging consumer initiatives in Spain. In our analysis we focus on their socio-ecological and economic 'configuration' and asses the impact of these forms of civic

engagement on farming systems and the wider food system. Finally we do suggestions on how cultural components within the new food networks could guide the improvement of socio-economic and ecological performance of food systems more in general.

"Territorial agri-food systems": relinking farming to local and environmental stakes to change farming sytems

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Criticism against agro-industrial food systems and intensive farming practices is increasing. Policies are implemented to encourage transition to sustainable agro-food systems, such as agri-environmental measures or supports to organic farming. However, in France, these measures are not really efficient (small number of organic farmers, increasing pollution of soil and water…). In this context, alongside public measures, many initiatives are launched by civil society in order to change farming practices, in particular through the construction of territorial sustainable agri-food systems. The aim of this paper is to understand how such initiatives can change farming systems.

For this, we will focus on a group of residents from a periurban area of Paris, who created an "Amap" with a conventional cereal farmer. The first objective was to produce local food, but also to create interdependence between farmer and non-farmers and to favor environmental-friendly practices, in order to legitimize the preservation of a periurban farmland threatened by urbanization. A few years later, to reinforce their action, the initiators of "the Amap" developed a project of short supply chain for local catering, which involved others famers of the territory, local administration and others potential consumers. With this case-study, we will show how non-agricultural stakeholders can facilitate change in farming practices by relinking farming to local and environnemental stakes and by developing specific incentives, through the development of a territorial sustainable agri-food system. Then, we will present the effects of these initiatives on farming-systems and farmers' practices, to finally suggest a model of change, where various stakeholders (agricultural and non-agricultural) contribute to the ecologization of agriculture in their "territoire".

Changing Consumer-Producer Relations in Austria

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The contribution will focus on the changes of consumer producer relations during the third food regime in Austria. By the end of the 1970s it became clear out of various reasons that the modernization of agriculture would increase disparities between more favored and lagging regions, making it necessary to look for alternative approaches. The first producer-consumer cooperatives were founded with support of rural development institutions. End of the 1980s mainstream agricultural policy took up the topic and proclaimed what became the "eco-social agricultural policy", promoting direct marketing as an alternative source of income and to prepare the countries´ accession to the EU. After EU-accession major supermarket chains began to focus on regional and organic products, contributing ultimately to a decline of direct marketing during the first decade of the new century. By the end of this decade however new forms of consumer-producer alliances emerged.

The contribution aims to analyze these developments along the lines of the sociology of translation (problematisation, interessement, enrolement, mobilization,(Callon, 1986)) for each of the different approaches and to follow their transformations until today. Furthermore the paper puts these developments into the context of wider societal changes encouraging or hampering the various approaches over time. Thus a picture of changing, and partly progressing consumer-producer relations

evolves. Although the different strands developed one after the other, they did not replace each other. This leads to a diversified landscape with a varying degree of cooperation between producer and consumers. Over the last three decades this shaped the image of the food sector within Austria to a large extend.

The concept of food sovereignty in relation to European Food Systems: importance, practical possibilities and challenges

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Food sovereignty is a concept based on an idea of food security (a varied diet with diversified, nutritious and culturally appropriate food) for everybody including the right of people to define their own food and agriculture, to protect and regulate domestic agricultural production and trade in order to achieve sustainable development objectives. In this paper we explore the concept of food sovereignty in relation to the current development of the European food systems with special emphasis on social food networks, and agricultural learning network building. Food sovereignty is often discussed in the Global South, e.g. Latin America, where the concept developed in strong popular movements. Which lessons can we learn from others, e.g. the so-called 'developing countries'? Danish and French cases will represent and contrast food system policies and social food and farmer networks in the North-Western European context. Based on this, we will discuss the special opportunities and challenges for reaching food sovereignty considering the current globalised world, challenged by financial and environmental crisis. Our agriculture has generally become increasingly industrialised and food systems increasingly controlled by major companies. This influences how feed and food is transported, stored, traded, consumed and wasted. Complex knowledge (including traditional) about agricultural systems and social relations in agriculture and food gets lost. The Common Agrarian Policies (CAP) influences the development of local alternatives farming systems and national food sovereignty. We will discuss the potential role and tendencies of alternative farming and food systems (e.g. organic, mixed farming with agro-ecological basis) based on cases where consumer-farmer networks increase common knowledge about food production, act and interact collectively for local social and political change by building food systems over which they as local communities can take ownership and control.

Between Food Democracy and Alternative Market Development: Exploring and Conceptualizing New Civic Food Networks Across Europe

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In recent years new types of consumer-producer cooperation in food networks have emerged, in which consumers/citizens play an active role in the initiation and operation and which thereby clearly go beyond producer-driven forms of direct marketing activities. Examples of such experiences are consumer cooperatives and solidarity purchasing groups of local and organic food (GAS, AMAP), Community Supported Agriculture (CSA) experiences, or collective gardening initiatives in which citizens jointly engage with food production for home consumption in the direct urban environment.

This paper aims to contribute to the analysis of this new type of food networks in different ways. First of all, on the basis of information from websites, secondary literature and expert knowledge a preliminary assessment is made of the magnitude and types of new consumer-driven food networks accross Europe. Second, an attempt is made to conceptualize these new food networks and understand their origin and operation in terms of new forms of "food citizenship". As part of this, motivations of involved consumers are analyzed as well as the extent in which these "civic food networks" (CFNs)

represent a change in the role of consumers from passive end-users of food to 'citizen-consumers' that intend to regain control over the ways in which their food is produced and provided.

Finally, an analysis is made of the institutional environment in which CFNs are embedded, including changes in food governance mechanisms and renewed relations between civil society, public policy and market governance and the potential role of CFNs as source and institutional 'niche' for social and economic innovation and the construction of alternatives for dominant agro-industrial food systems. Are newly emerging CFNs merely a collection of individual and localized initiatives or do they rather together compose a social movement and/or political project for regaining 'food democracy' or 'food sovereignty'?

Collective action for change: different strategies of shaping the food system

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Driven by a rising concern about the effects of the prevailing conventional food system, which is widely based on large-scale agro-food enterprises and imbalanced power relations along the supply chains, civil society mobilization for collective action is increasing. Concerned actors actively engage in shaping the food system through bottom-up initiatives aiming at establishing more sustainable modes of food production and consumption. Often this implies awareness about the various political and social dimensions of food. In contrary to the conventional system, which is characterized by centralized governance models and standardized procedures, 'civic food networks' aim at more democratic models in order to better meet the existing diversity of actors' needs. This may concern farming practices, business models and consumption habits on the micro-level, but also broader visions about changes in society and the economic system like community building, solidarity, social justice, alternative economic systems, etc.

The proposed contribution will exemplarily present three case studies from Austria by comparing the strategies they established in order to shape the food system according to how they pursue different pathways for transition towards more sustainable food and farming systems. I will introduce a Food Coop established by young urban people, who buy collectively from organic farms; a farmer's association cooperating with an organic wholesale trading company, which emerged from a producer-consumer cooperative; and a farmers-business cooperation. While the first example represents a kind of 'grassroot civic food network' criticizing the neoliberal market economy in general, the other two case studies aim at more moderate changes within the current food system like fair business relations. However, all examples imply interesting aspects of as well collective forms of governance as social and economic innovations through networks and cooperative action, which may represent starting-points for transitions towards a more sustainable food system. system. The presentation will draw upon empirical work carried out on the EC FP7 project 'FAAN – Facilitating Alternative Agro-Food Networks: Stakeholder Perspectives on Research Needs', which involved academic institutions and civil society organisations from five European countries in 'co-operative research'.

Filling a blank space: A study on the emergence of food communities (Fødevarefællesskaber) within the Danish foodscape

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Across Europe and North America, novel forms of consumer-producer networks have emerged for the past 10-20 years. Some of these can be described as being 'civic', as they are distinguished by

producer-consumer relations and alliances which extends the conventional food market settings. Examples include networks such as solidairity purchasing groups and community supported agriculture. This phenomenon has only recently emerged in Denmark, in the shape of Food Communities (in Danish: Fødevarefællesskaber). The paper is based on case studies of two Danish food communities, one in the capitol of Copenhagen and another one in another major city, Århus. Our inquiry is divided in two parts: one part which focus on characterizing the Danish food communities in relation to the field of alternative food networks in Denmark. What is novel about these communities? How do they differ from other networks? The second part of the inquiry is an analysis of the food communities as community. The particular relations which are forged within 'civic' food networks are supposed to be transparent, just and equitable. Departing in Bauman's notion of community as well as critical accounts of the 'dark side' of local-based development, our aim is to determine whether the food communities can be characterized as aesthetic or ethic communities. Issues include which processes of exclusion and inclusion can be observed, how food quality and economy is negotiated between producers and the involved citizen-consumers. The inquiry can be summarized in two issues: how are the food communities novel? And are they good examples of just and equitable (food) communities?

Achieving Sustainability through Local Food Systems in the United States

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Over 100 million people reside in the highly urbanized states on the eastern seaboard of the United States. Maintaining this population requires importing food from across the United State and around the world. Much of this food is produced using oil and water intensive industrial agriculture systems which may not be sustainable in the long run. Other issues are also driving farmers and consumers in the eastern states and across the United States to develop more sustainable systems. Consumer awareness of issues related to agricultural sustainability is increasing. There is desire to regulate development to maintain open space and preserve farm land. There is a movement among consumers to increase purchases of locally produced food which they perceive as being fresher, higher quality, and more sustainable. This movement toward local sustainable systems is not without problems as the production, transportation, and marketing infrastructure of these systems are not as well developed as industrial agriculture systems.

Various local food systems are developing on the east coast and across the United States. These systems bring consumers in closer contact with farmers. They reduce the carbon foot print of food consumed and enlist consumers in supporting local farms and sustainable farming practices. These systems include farmers markets, community supported agriculture, institutional sales, farmer/restaurant markets, food banks for the undernourished, urban and backyard farming, and internet based marketing. The number of consumers obtaining food from these systems is still low but continues to increase yearly. The number of farmers involved in these systems is also increasing. This paper analyzes the recent developments in these local food systems and illustrates innovative ideas that are improving connections between farmers and consumers. This analysis also provides a base line which can be used to compare local food systems in Europe and other areas of the world.

Trustworthy food – "a cheesy example". Enacting trust and credibility in the Danish dairy food sector

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Short food chains, local food networks and other networks are typically attributed with positive notions like community, trust and credibility. These attributes are supposed to an emergent property of 'alternative' forms of organization, such as community-based forms of organization, which extends the conventional market setting. Departing from a case study on the Danish dairyscape and in particular the Danish dairy company Thise and their cheese product 'Vesterhavsosten', the paper traces the different ways by which credibility and trust are enacted with regards to this particular cheese. It is a case of different actors, consumers as well as producers, actively deploying different strategies when it comes to evoking a sense of credibility and trustworthiness. Different elements and notions of quality, site specificity (terroir) and nostalgia seem pivotal – but how are they set in motion? The paper examines how elements of credibility and trust are attributed, stabilized, objectified and arranged – or – enacted in the Danish dairyscape. It is discussed how the enactment of these producer-consumer relations might transcend established distinctions between 'conventional' and 'alternative' food networks.
The presentation will include an interactive 'cheese moment'.

Reframing Food: Understanding Trends in Consumer Food Purchasing and Implications for Agri-food Movement Mobilization in the Northwestern U.S.

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This paper examines trends in attitudes and behaviors surrounding food consumption in the Northwestern United States. Research across the full spectrum of food system participants suggests promising opportunities to reshape conventional agri-food market relationships, however, it also reveals a complex array of motivations for participation in alternative food networks and key vulnerabilities and obstacles. The results of random sample consumer telephone polls, farmer surveys and focus groups, and analysis of direct marketing initiatives conducted over an eight-year period in Washington State indicate a proliferation of alternative food distribution and marketing initiatives and steady growth in the numbers of consumers, farmers, retailers, and institutional food buyers engaged in such efforts. Nevertheless, despite vast agricultural production capacity and an apparently sympathetic public, only a tiny fraction of the Northwest food supply chain is currently sourced regionally. Current theoretical understandings of the globalization of the food system and the role of social movements provide a basis for investigating the configurations, tactics, and effectiveness of locally driven strategies to reembed market relationships in civic and environmental value-systems. Particular attention is focused on the potential of various mobilizing frameworks to transform the meanings that consumers and farmers ascribe to "food" and thus inspire individual and collective action to overcome substantial structural barriers to enhancing food system sustainability.

Emerging localized food networks in Denmark – from 10 to 3,100 members and 16 branches in less than 2 years

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One of the fastest growing food related social movements are citizen driven food networks. The Danish initiatives emerged in Copenhagen from an open culinary, social, environmental and organic oriented network. The theories and strategies of the original initiative is presented in this paper, together with an analysis of how this has evolved and expanded. The challenges this rapid expansion puts on the internal network and organisation, and on the local food supplieres - the organic farmers - are elaborated in this paper. Also – from a rural sociology perspective – the interaction and communication between the citizen-consumer and the farmer are presented and analyzed.

Convenors:
Helmi Risku-Norja and Bent Egbjerg Mikkelsen

Public catering has a key role in this. If public catering were committed to sustainability principles in food provisioning, it could provide a more effective channel for improving food system sustainability . This is done both through the sheer volume of food purchases, but especially through civic food and sustainability education. A comprehensive view on sustainability beyond mere environmental focus has contributed to interest in re-localising food systems. Contemporary consumer campaigns encourage consumers toward more local food purchasing as part of sustainable eating habits.

Public Sector Food Procurement and sustainability in UK schools

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The paper will consider national policies aimed at promoting sustainability in public sector food procurement and how these have been interpreted by local authorities. It will review the development of these policies since the launch of the Public Sector Food Procurement Initiative in 2002. This will include efforts to promote local food sourcing and to encourage small food producers to supply the public sector market through supplier engagement, sub-division of contracts and establishment of local distribution hubs.

Paper will also consider efforts to

- promote animal welfare eg by introducing free range eggs
- reduce the carbon footprint of school catering eg through reducing red meat content.

The paper will examine the work of the Food for Life Partnership [FFLP] which has been working with schools to enable children to eat good food, learn where it comes from, how it is produced and how to grow and cook it themselves.

FFLP is an alliance of four English NGOs - Soil Association, Focus on Food, Garden Organic and Health Education Trust. Lottery funding has enabled it to work in every English region. Schools are awarded accreditation at three levels: Bronze, Silver and Gold - depending on percentages of local and organic food served from fresh ingredients. Over 3,800 schools are enrolled and over 300,000 children eat FFLP accredited meals every day.

Independent evaluations has found evidence of success including:

- Improved eating habits among primary school age children and parents
- Increased take-up of free school meals
- Improved overall school performance
- Benefit to local economies from increased spending on local food

The paper will assess how these sustainable procurement initiatives are coping with new circumstances since the change of government in May 2010.

LOMA- Local Foodstrategies for children and Youth in public institutions

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The PhD study:'LOMA - Local foodstrategies for children and youthin public institutions is based on the resarch question: How can local foodstrategies - according to the LOMA principles involving health promotion, food education and social innovation - improve sense of coherence, actioncompetence, health consciousness and healthy lifestyles among children and youth in public institutions and thus contribute to reduction of social inequality?

The research project is conducted as a casestudy and financed by University College, Lillebælt and Aalborg University and will be conducted by PhD. Dorte Ruge from 2011-2014. In the new school of the casestudy, there are 700 young people at secondary level and approximately 90 teachers and staff. The school is an element in a local strategy, aimed at promoting coherence and integration between groups of youth with different social backgrounds. Moreover re-localisation of foodchains is a focus area. According to this, the local Counsil has made a financial priority to the establishment of a new cook-and-serve kitchen and cantina where the 'LOMA principles' will be used as a guideline in order to enhance participation, health education and local cooking from freshly produced - and preferably organic - local food.

At the moment, the projectorganisation, established around the developmentproject is working hard and successfully on the preparations that consist of quite different efforts: Participatory processes, logistics, cooperating with local farmers,internal and external communication, leadership and curriculum activities. These elements are also objects in an actionresearch approach giuded by the phd. student and UCL. In July 2012 preliminary results from the research acitivities will be presented on the 10th European IFSA Symposium - results that will contribute to the the aim of 'new modes of organisation for the sustainable food systems of tomorrow'.

The Public as political consumer – caseinsights from developing regional public food strategies in Danish Region Nord

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This paper aims at giving insight from the case of Region North in Denmark and the experiences so far regarding barriers and opportunities in relation to local food sourcing for the hospitals in the regions. The paper reflects on the opportunities that new cooperative organisational project based frameworks offer in terms of overcoming constraints and barriers and concludes by giving recommendations for actions at short and long term that can facilitate local and regional food sourcing for public food systems. In addition to the procurement strategy the region and in particular the main hospital in the city of Aalborg has enrolled in a joint project that aims at facilitating the use of local foods in its foodservice. Thus the hospital is the main case study of FoodserveInspire project – a cooperation between Aalborg Hospital and Aalborg University . The partners have been developing the project within the framework of a partnership based on the principles of communities of practice and involving a number of local businesses. The findings from the case show that the idea of local and regional public food sourcing is a fragile one and that it is currently challenged by other competing and more globally oriented sourcing strategies as the plans for a nationally based 'Region Denmark' procurement contract. Maybe this is where the public as political consumer enters the arena of sustainable public food procurement.

Local public food – upgrading match between concepts and structures

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Maintains a high-level expert in Finland: "Local food has grown into something like a social movement." The statement catches poignantly the broad social support for the concept of local food. However, public food represents a societal concept, loaded with expanding responsibilities of the welfare state not only to provide citizens with healthy but also sustainable meals. These include aspects of supporting local economy, more equitable trading relations and decreasing environmental impacts.

Here the welfare state grows into a "Green State", in need to support its policies by factual understanding of the developmental trajectories for sustainable food systems.

This paper analyses the concept of local food as it is understood by public procurers and examines the structural match of local food between supply and demand in public procurement. The paper is based on qualitative and quantitative data about public procurement of local food during the first decade of 21st millennium. The qualitative data stem from public caterers representing organizations across Finland, offering a valid view about the dependency of the size of the organization and its understanding of the concept of local food. The quantitative data have been collected by a survey covering the Finnish municipalities, and it shows the proportion of 'local food' used by public catering in different parts of the country. The results suggest issues of structural development both in supply and demand and possibilities to understand the concept of 'local food' in more functional ways than currently is the case.

Convenors:
Teresa Pinto-Correia and Lone Kristensen

The workshop is related with the theme of increasing complexity of interaction between farming systems and the rest of the society. It will discuss new conceptual approaches that make it possible to combine the multiple dimensions that shape rural spaces, based on the landscape as the meeting platform for biophysical and socio-economic dimensions, and trends and processes at different scales.

From Farming-System-Analysis to Land-Use-System-Analysis: How to integrate Eco-System-Services and Non-Farm Communities

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Farming system analysis has been a popular concept over the last decades to integrate ecological, economic and social aspects into a holistic view of rural life. For the purpose of jointly analysing rural livelihoods and related changes in rural areas as well as finding pathways to develop new options for rural populations, farming systems analysis was a good tool. However, the concept has been shown also its limitations, especially with regards to an eventually too strong focus on farming and farms as main organisational units studied. As recent studies from different places in the world have shown, many times rural populations, and in particular the poorer segment of rural dwellers, have found different institutions than farms which enable them better to find coping strategies than being connected to farm activities. Many rural inhabitants, for instance, rely no longer on food production for their livelihoods; rather other income or resource extraction options, remittances, payments for services, tourism, etc. have gained importance. Some scholars speak already about land-use-system-analysis, rather than farming-systems-analysis. Another major driving force behind the need to broaden the concept is the debate on eco-system services (ESS) and human well-being, as derived from ESS. Most ESS are found at landscape level and are not only directly related to farm activities. Furthermore, as the economic background is that ESS are getting scarcer and under threat due to common pool resource management problems, the public partly seeks to sponsor ESS through payments or through better governance.

In this regard it is the objective of the contribution to discuss the consequences of the ESS concept for a broadening of the farming-system-analysis concept (eventually merging into a land-use-system concept). We will provide a literature review highlighting the logic for a conceptual amendment. In a second step the aspect of beneficiary recognition and the institutional as well as organizational choices and consequences, needed to accommodate the creation of well-being from ESS valuation, will be put into perspective of land use offering a research agenda. We will focus on landscape elements which are important for ESS value generation, as related to tourism and carbon sequestration. Both ESS, similarities will be outlined.

Tracing territorial capital

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The Minho Delta, its river being the natural border between Portugal and Spain, has a hydrological basin of 17,080 km2 of which its estuary is within a Natura 2000 site. In the INTERREG region, landscape conservation and nature preservation are challenged by the improvement of the effectiveness of regional development policies. The area is characterized by a very low human pressure and

important habitats favourable to the occurrence of fish species of economic and/or conservation value and several important bird species and mammals. These characteristics together with a high attractiveness of its surrounding mountains and scattered scenic settlements provide rural endogenous development potentials in which ecological and economic progress might go hand in hand. Sustainable development potential however is constrained at the landscape level where contemporary rural policy making is largely absent. In this paper we analyse the multiple dimensions that shape the Minho Delta as rural space, and explore its 'optimal' socio-ecological configuration. This might serve as 'Leitbild' for the organization and the implementation of a new institutional level. We think this landscape based approach will result in the incorporation of stakeholders in the region and in the negotiation of interests, which if carefully managed results in strengthening the socio-ecological and economic performance of the rural region of the Minho Delta as a whole.

High Nature Value Farming Systems classification: A landscape -based approach

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The High Nature Value (HNV) classification of farm systems, proposed by the European Environment Agency, emerges as more relevant today in the preparation of rural development programme within the CAP post-2013. HNV classification is applicable across all Europe and seeks to define objective criteria for identifying farm systems that support high biodiversity values and landscape quality, which may also be linked to other ecosystem services. Considering that changes in rural space, taking place across all Europe, have been occurring at different levels, paces and intensities, the assessment of HNV farm systems also needs to consider this differentiation. Spatially based approaches at the regional level, linked to landscape based indicators, may be the way forward to reliable information, required for the contemporary rural policy making. This presentation is based on a case study in Alentejo region in south Portugal dominated by traditionally managed agro-forestry systems which allow maintaining the specific character of these landscapes and have created conditions for establishing other functions (nature conservation, recreation, etc.). These traditional extensive practices have a great impact on vegetation composition, species distribution and landscape pattern and consequently they influence landscape quality and attractiveness for recreational activities. Therefore, this close relationship between farming practices and landscape patterns led us to seek what defines a HNV farm system in the Alentejo context and to identify its distribution considering landscape as the basis for a spatial approach. Recognizing the diversity of farm system types, and aiming to identify the associated landscape patterns and relate them with the HNV classification, the proposed presentation will focus on the methodological approach, grounded in preliminary field work, and the consequent development of the landscape based HNV indicators, applicable to Alentejo.

Methodological approach to create indicators contributing to measure effects of policies in rural areas - Case study in Alentejo, South Portugal

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Previous work has been highlighting a close relationship between landscape characteristics and socio-economic development. On one side, landscape contains economic value that can manifest itself through the implementation of certain economic activities. On the other side, the process of economic development frames landscape composition and configuration.

So far territory characterizations have been focused mainly on producing a characterization of countryside as a whole, but not considering the different characteristics and dynamics of rural areas. Therefore, understanding the specificity of the current socio-economic dynamics in rural areas with different landscape characteristics is of utmost importance. A crucial issue to explore is which set of indicators can help in delivering appropriate economic policies that reinforce socio-economic development and enhance landscape capacity to sustain themselves.

The aim of this paper is thus to develop a methodology for a typology based on a set of different indicators (landscape, social, economic, institutional) in order to identify the different potentialities or vocations for Alentejo territory in south of Portugal. With indicators application, different vocations or potentialities of the territory can be measured and implemented in policies. The analysis and assessment of these indicators will result in a typology which can be a valuable tool to inform both the public in general and the decision and policy making agents, including potential investors.

Thus, the knowledge produced will allow to identify which activities may synergistically underpin a transition to sustainable rural development in each area, at the municipality scale.

The idea is to consider the various dimensions of rural and assess how they interact or may interact in the future by, among others, specific and focused public interventions.

Concepts for the assessment of a new biobased economy in rural production landscapes

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The European Commission has a vision for a renewed biobased economy, with more multifuctional production landscapes. This implies both an increased production of biomass for food, fibres and energy, and an increased delivery of other beneficial services in form of environmental protection and rural development. Thereby it is an example where new research approaches are needed to make it possible to combine the multiple dimensions that shape rural spaces, based on the landscape as the meeting platform for biophysical and socio-economic dimensions.

This study presents a new landscape level approach to model the biophysical potentials for increased biomass harvest in Denmark, and indicators for the socio-economic and environmental effects of different scenarios for such increased production. Thereby the results serves as input to the ongoing productivism – post-productivim debate related to rural spaces in Europe.

In a case study it is discussed how large scale conversion to biorefenery technologies, where the total Danish harvest of biomass is increased by 10 million tonnes via the conversion to new types of crop production and land management, will effect specific Danish production landscapes around the city of Viborg. Finally, the empirical results and the problems presented are related to the common conceptual model presented by the workshop convenors, aiming to contextualize how the problems in relation to the concrete scenario results can be considered with the landscape as the meeting basis, and used as input for a discussion of innovative models for future farming systems, landscape research and management.

Exploring farmers' interaction with landscape, society and environmental regulation using Fuzzy Cognitive Mapping

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The way farmers translate the framework of agricultural policies, farm economics, environmental regulation, societal needs and wishes as well as personal views, values and preferences into landscape management decisions is as of yet under-researched. Policy-making could become easier and better targeted if the mechanisms driving the landscape development were better understood.

This presentation is about the use of 'Fuzzy Cognitive Mapping' (FCM) to elicit information on the interconnectedness of drivers of agricultural landscape use and change. FCM is based on an Idea from Bart Kosko to extend cognitive and mind mapping approaches in management studies and has recently been adapted to applications in landscape level socio-ecology and -economics. It is a 'weighted graph', put together during an interview or workshop that allows for comparison between different case studies and can be used to address 'what-if' questions and simulate the changes of a complex system in response to e.g. policy interventions.

In this study, it is used to compare two Danish and Scottish research landscapes with the aim of formulating policy recommendations in the field of agro-ecosystem services. The emerging strength of the approach lies in the ease of combining academic, regulatory and practical local knowledge into an expert network in an unbiased way. It is also very conducive for actively engaging stakeholders in the research process.

How the landscape agronomy framework can enhance the landscape management of farming systems?

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Agronomists are increasingly faced to landscape as a rising issue in the multifunctional development of farming systems. Furthermore, the European Landscape Convention has formally acknowledged the expectations of local stakeholders and decision-makers for a greater support to conserve, manage and plan the landscapes. Therefore, agronomy and other disciplines are challenged to explain the landscape dynamics with new multidisciplinary approaches. The “landscape agronomy” (LA) has been recently proposed to frame landscape-related issues and to organise the interdisciplinary interaction of this novel branch of agronomy. Uppermost LA proposes to widen the agronomic spatial concept beyond the field or the farm to the landscape. For that, its theoretical framework connects the relations between farming practices and natural resources to the continuous reshaping of land use patterns operated by farmers. Early LA studies have explored the coupling of data-mining of crop-sequence patterns (regularities) and processes of farming decision-making (rules). Hereby we aim using LA framework to discuss how enhancing methods and interdisciplinary skills to pursue a greater agronomic contribution to landscape management issues. Firstly we point-out that new methods should model interactions of farming practices and natural resources into different scenarios of land pattern dynamics. Secondly we highlight how landscape should be assumed as meeting platform structuring the interface with other disciplines. To give two preliminary examples, extended interactions with landscape ecology should deepen how and where farming land use dynamics elicit changes on the environmental functioning of land patterns. With geographers, landscape agronomists should strengthen the spatialization of farming dynamics as function of place-based expectations and natural constraints. In conclusion, we discuss how the responses of landscape agronomists to methodological and interdisciplinary challenges could

bridge the gap toward a more general land management science. The perspective is to debate the relevancy of knowledge produced into this framework for the local landscape managers.

Convenors:
Paulina Rytkönen, Artur Cristóvão and Andrea Marescotti

Globalization has accentuated the rationalization process of the agro-food sector. The main response to this process is the emergence of a localized agriculture and rurality that entails the rise of a vast number of varied types of production, organisation and market innovations. One of these is the valorisation of spaces with the introduction of new crops or revalorisation of previously marginalized spaces. In Europe this is a higly assymetric process. This proposed session highlights these assymetries with a special focus on processes of valorisation.

Rural innovation, farm evolution and territorial indifference: a case of governance failure?

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The idea of "modern rurality" fits with a new concept of innovation, either on territorial that in farm scale; in this perspective, innovation does not imply technical aspects but it includes a coherent process of growth integrated with rural environment. As recently stated by Knickel et al. (2009): "innovation involves much more than technology; more and more it relates to strategy, marketing, organization, management and design. Farmers are looking for alternatives to industrial agriculture and don't necessarily they apply "new" technologies. Their novelties emerge as the outcome of different ways of thinking and different ways of doing things".

The paper analyses the capability of a rural territory to innovate and, particularly, farms' attitude to change. An empirical analysis will be proposed by comparing two groups of farms and by evaluating their attitude to innovation. The first group of farms is located within a rural districts, as recognized according to the Italian law n. 228/01; the other group operates outside the rural district, but in rural areas with the same degree of rurality. Is district farms' propensity to innovate higher? To investigate the propensity to innovate and the way in which farms adopt innovation, an innovative milieus concept is proposed: this approach can be considered as useful tool of analysis to really understand innovation in rural areas. The application of this method requires the comprehension of the three paradigm characterizing it:

- organizational paradigm;
- technological paradigm;
- territorial paradigm.

Of course, the "district atmosphere" should foster a superior propensity to innovate: is this the case? And, if not, are we in presence of a failure in the rural governance?

Selling directly fresh and local products, looking at a new localized rurality: the case of PROVE Project in Portugal

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In Portugal, changes in the market of agricultural and food products have led to a huge concentration of supply in three large distributors, who represent about three-quarters of sales. This process excludes or hinders the access to the market of a large number of small-scale producers. These developments contribute greatly to the economic exclusion of small producers, the abandonment of agricultural areas, the decline in the number of farms, and the stagnation of the rural economy in many regions. The

survival of these small producers and the revitalization of rural areas require innovative measures in several domains, looking at a new localized rurality. Organization and market access are fundamental. The Project "Prove - Promote and Sell", supported by the Leader network, is a direct/proximity selling experience, through baskets of fruits and vegetables, having as objectives: to support producers in the promotion and marketing of their products; to ensure the freshness and quality of the products; and to strengthen the ties between rural and urban communities. This paper presents the results of a study of this project. The information presented is the result of document analysis and questionnaire interviews to 56 producers (about 97% of the total). Topics covered in the survey include the characterization of producers and farms, the impacts of the project on the farm, relationships with the consumers, advantages and disadvantages of this method of marketing, areas for improvement, and perspectives for the supply of other products and services in a logic of diversification and multifunctionality. The study also aimed to analyze the project contribution to sustainable development and maintenance of local territorial dynamics. The results show that farmers increased the area and diversified the production, and improved marketing conditions and household income.

Sweden - an emerging wine country - unexpected outcomes in the making of a new European rurality

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Sweden has been a wine importing country throughout its entire modern history, but commercial wine production is a relatively new phenomenon although the public interest for wine, in all its dimensions, has increased considerably over the last decades.

Today there are around 330 vineyards and a dozen of them have permission to process vines on a commercial basis. Only two decades ago, such a development would have been a utopia, both from a climatic, as well as legal perspective. When Sweden became a full member of the European Union in 1995 four of the five alcohol monopolies were abolished and wine production became possible. This change of policy paved the way for a potential development of a wine sector in Sweden. This was however, not the only requirement to achieve such a development. The cold climate, lack of experience and the large imports from other countries are important obstacles to the development of a Swedish wine sector. However, in the last 15 years wine productionhas become reality- although under very different conditions than its European counterparts. Some arising questions are therefore: How did this happen?; Which are the main drivers behind this development; and Compared to other European wine sectors, under which conditions does the Swedish wine sector work? As the wine sector grasps the organization of the territory under districts or other forms,the study also aims to analyze the emergence of a new type of local territorial dynamics and organization of the territory in Sweden.The article is based on a survey that grasps all commercial wine producers in Sweden. Topics covered include a characterization of producers and farms, including related activities such as tourism, services, etc. It also includes the relationships with the consumers, advantages and disadvantages, their relationship to the retail monopoyl, their cooperation with other producers and/or rural stakeholders and their contribution to rural development in their area.

Kalix löjrom - obstacles and possibilities in the implementation of Sweden's first PDO

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The use and implementation of PDOs is a well established practice in most EU countries. Prrevious studies show that the use of PDOs is directly related to previous experiences as well as the relative importance of the agro-food sector in a country's economy. In the case of Sweden, the agro-food sector has been oriented towards continuous structural rationalization since at least the 1930's. However, the transformation pressure exerted by a rising competitive level in the market, that emanates both from global as well as regional European sources led to the adoption of new strategies. These strategies entail the on-farm elaboration of farm produce, the diversification of activities as well as the use of certification schemes. In the case of Kalix Löjrom, the strategy selected was the adoption of a PDO, as a way of entering a valorisation process for export purposes as well as defending the product against dislojal competition of products with less quality. As this is the first experience with a PDO in Sweden, the case of Kalix Löjrom offers a rare opportunity to understand the actual problems in implementing a policy tool developed by Southern European countries in a country like Sweden. Thus the article highlights the institutional and structural shortcomings discovered in this process and offers new knowledge and reflections valuable for the future adaptation and implementation of previously unknown policy instruments.

Romanian agriculture between biodiversity and intensification: the speficic role of small-scale agriculture in mountain areas

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Romania supports the introduction of the "small farm scheme" under the direct payment in the context of the reform of the Common Agricultural Policy (CAP): simplified and -forfaitaire- support for small farm on a volontary basis. This claim is due to the difficulties of implementation of CAP in the current semi-subsistence agriculture, common to many EU member statesn especially the new Member States.

This is compounded by the fact that a vast majority of payments from the first pillar (income support) are not well implemented in the mountain areas. Agro-environmental payments are also difficult to implement because of the property of the land context (local autorities are offen legal owners off the communal pastures). Then additional payment type Natura 2000 are not yet implemented in these areas, because of co-financing requested from the states, besides the implementation of rural development programs have taken the delay, due to the delimitation of beneficiaries on going.

This contribution will present the current situation of the small scale farmers in the context of the general agricultural sector in Romania and discuss the pro and contra arguments for the small farm scheme.

Multifunctional transition pathways: How are multi-stakeholder's land management influencing farm systems resilience? Case study of Mediterranean agro-forestry systems in South Portugal

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The changing role of agriculture is at the core of transition pathways in many rural areas. Productivism, post-productivism and multifunctionality have been targeted towards a possible conceptualization of the transition happening in rural areas. The factors of change, including productivist and post-productivist trends, are combined in various ways and have gone in quite diverse directions and intensities, in individual regions and localities. Even, in the same holding, productivist and post-productivist strategies can co-exist spatially, temporally, structurally, leading to a higher complexity in changing patterns. In south Portugal extensive landscapes, dominated by traditionally managed agro-forestry systems under a fuzzy land use pattern, multifunctionality at the farm level is indeed conducted by different stakeholders whose interests may or not converge: a multifunctional land management may indeed incorporate post-productivist and productivist agents. These stakeholders act under different levels of ownership, management and use, reflecting a particular land management dynamic, in which different interests may exist, from commercial production to a variety of other functions (hunting, bee-keeping, subsistence farming, etc.), influencing management at the farm level and its supposed transition trajectory. This multi-stakeholder dynamic is composed by the main land-manager (the one who takes the main decisions), sub land-managers (land-managers under the rules of the main land-manager), workers and users (locals or outsiders), whose interest and action within the holding may vary differently according to future (policy, market, etc.) trends, and therefore reflect more or less resilient systems. The goal of the proposed presentation is to describe a multi-stakeholder relations model at the farm level, its spatial expression and the factors influencing the land management system resilience in face of the transition trends in place.

The Role of Minor Crops in the Valorisation of Marginal Rural Areas: the case of Iris Pallida

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Nowadays the problem of valorization of marginal rural areas in Europe is significant. In Italy, despite the wide globalization that has developed in the agro-industrial system, some traditional agricultural crops with high added value may play an important role for the environmental preservation and social and economic development of some marginal rural areas.

The purpose of this paper is to analyse the potential role and limits of minor crops in the valorisation of marginal rural areas. The paper presents a case study analysis on the Iris Pallida supply chain. Iris Pallida is a minor crop, whose rhizome is used by the international fragrances industry. The cultivation is limited to only two subregions in Tuscany (Chianti and Pratomagno), in very remote areas and it is usually complementary to the olive oil production.

The field work carried out at local, national and international level has allowed to describe in detail the local production system, the threats to its survival, and the opportunities of its valorization thanks to its connections to the global market and the high interest of the local stakeholders in supporting it for its high potential to revalorize and environmentally protect some rural areas that are now abandoned.

A development of the cultivation could answer also to an increasing request of the rhizome from French fragrances industry, due to its outstanding quality attributes.

The paper addresses an important re-emerging issue: “glocality” as a local flexible response to the pressures and threats of the globalisation of the agro-industrial system.

Convenors:
Sylvie Lardon, Camilla Moonen, Kirsten von der Heiden and Jiri Votava

Changes in society require innovative learning environments and approaches. Previous IFSA sessions on education in landscape and territory agronomy will be enriched with life-long learning experiences, action-research and distance learning for agricultural and rural development. A wide variety of learning processes will be presented and discussed to stimulate innovative approaches able to increase understanding of land dynamics for local stakeholders, future researchers and land managers. All presentations will be analysed on a common grid which includes several issues: interdisciplinarity, connection to the field, spatio-temporal relationships, context-dependence, reflexivity.

Research-Education-Action platform for territorial development - A landscape and territory agronomy perspective

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Landscape and territory agronomy focus on agro-environmental issues related to farming practices and they often put this in a context of non-agricultural land use issues. . Farms still have a central position in these research projects, but larger spatial scale, with non-agricultural land uses and stakeholders are taken into account. Stakeholders' involvement thereforeincreased from farmers to all land users, rural citizen and territorial authorities involved in land management and territorial development.
Previous IFSA sessions (2008 and 2010) about education in landscape and territory agronomy concluded that more attention should be given to:

- stimulate the participants to a reflexive attitude, by the complementary enrichment of teachers, students and local stakeholders, case studies analysis, debates on issues and terminology, effectiveness of such a territorial agronomic approach;
- combine scientific concepts with stakeholders' knowledge, theoretical contribution with practical work, in a participatory approach of innovative solutions for specific situations with respect of their diversity;
- institutionalize these experiences within existing MSc and PhD courses to give continuity in the long term, because time is needed to improve such interdisciplinary approaches, and begin to train young researchers for new skills and new jobs.

Our experiences in education in landscape and territory agronomy showed the need to further elaborate five groups of competences including skills needed in the field of capacity building:

- reflexivity: capacity to modify research questions and roles of the researchers with stakeholders
- co-construction: need of education for interdisciplinary research practices
- connection to the field: need of education for participatory research practices
- spatio-temporal relationships: education to territorial issues by spatio-temporal analysis (territorial diagnosis, scenario building).
- adaptation: capacity to formalize the methodological itinerary of the research.

These are the challenges of a Research-Education-Action platform for land management and territorial development that we aimed to build.

Identified roles of agronomy in land management issues - A Comparison of five interdisciplinary PhD theses

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An introductory literature review highlights the growing attention within this discipline to processes taking place at farming region and landscape scale beside the classical spatial scales at cultivated/experimental plot level. This recent evolution in agronomy finds its origin in newly emerging land management issues. Meanwhile, geography and other disciplines are stressing the need for a greater integration of multifunctional agricultural activities into the decision-making processes at the various levels of land management, such as provinces, municipalities or watersheds. This requires also that studies on farmland management include explicitly the different environmental and social contexts influencing farming activities.

In this paper we aim to analyse how recent agronomic oriented researches are facing and supporting various land management issues. We have compared five interdisciplinary PhD theses examining their definitions and methods of analysis for: the farming system, the local land management issues at stake, the spatial scale selected for the study, the stakeholders' involvement and the interaction with other disciplines.

Common issues which emerged from this comparison are delivery of agro-environmental services, sustainable land management and landscape conservation. Multiple spatial levels were considered, which included at least one administrative unit of policy decision/implementation. Consequently, the explicit (re)definition of some agronomic concepts and methods was needed. Regarding the interdisciplinary framework, the theses have stressed the interactions among agronomy, geography and ecology. All theses aimed at delivering tools for decision-making support, mainly in the form of cartography. Nevertheless the participation of local stakeholders was generally included as a final step; herewith the settings of stakeholders' involvement were various. In conclusion, we discuss how the produced knowledge has enhanced the land management issues in local planning tools. On these bases, we stress finally the issues at stake to strengthen the roles and contributions of agronomic oriented education and research to farmland management and development.

Interdisciplinary Landscape Management: lessons from a join PhD programme where the spatial, the ecological, the economic and the social dimensions are combined

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The PhD programme on Interdisciplinary Landscape Management has been running since 2009. It is a three year programme, with 180 ECTS, for PhDs in the broad area on Landscape Analysis and Management combining approaches from different disciplines. It is a joint programme of three Portuguese Universities and it is coordinated by researchers from these three institutions, covering complementary disciplinary approaches: spatial, ecological, economic, social, institutional and modelling. The programme is grounded on a conceptual model on the relationships between the spheres of landscape, services, values, institutions and decisions, at different and multirelated scales, inspired among others by the conceptual framework on ecosytems services analysis from the TEEB report, 2010. For the development of PhD research, though, with landscape at the centre, it is being demonstrated that research can only be successful if focused on only a few of these dimensions. The aim of this presentation is to share the experience from this PhD programme and the potentialities of a clear linkage to a conceptual integrative model.

Analyzing research practices of education experiences for agriculture and territory development

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An INRA working group of researchers and teachers implied in education and training on agriculture and territory development highlights their practices and the new skills and competences they developed. They analyze their experiences by asking these questions:

- Action: What are the territorial dynamics involved? Who are the stakeholders? How do they bring new forms of knowledge? How to evaluate the impact of research and education on the territorial processes?
- Education: How to conceive innovative education and training programs in order to develop new skills? Who is concerned? How to evaluate the educational properties of such collective experiments?
- Research: What are the researcher's conceptual frameworks? What disciplines are combined? How to interact in a participatory process with all the actors concerned? How to enhance the value of the produced knowledge?

The analysis of ten experiences resulted in a first typology of the degree and modalities of participation of the researchers and teachers, the students and training persons and the institutional actors, in a shared partnership for the emergence and the governance of innovative processes.

To formalize the contribution of education and training to these action-researches and multi stakolders approaches, we use the five concepts (interdisciplinarity, connection to the field, spatio-temporal relationship, context dependence adaptation and reflexivity) of the Research-Education-Action platform which could become a collaborative one to conduce the change in agriculture and territory development.

New skills and competences have to be improved by all the participants (researchers, teachers, students and training persons, institutional actors) of these collective knowledge processes.

Supporting integration and co-development as processes of collective action and learning in catchment management in Australia

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In this paper we describe the outcomes of an action research inquiry into knowledge making as part of a large interdisciplinary catchment research project, the Farms, Rivers and Markets (FRM) project. The FRM Project aimed to integrate academic research and community knowledge/s in the development of new water management options in an agricultural region, the Goulburn-Broken catchment in north-eastern Victoria, Australia. Key findings of this research include the dynamics and processes that support integration amongst diverse disciplinary knowledges, and knowledge partnerships between integrated research projects and diverse communities of practice in agriculture and water management. We understand action learning to involve coordinating a variety of disparate practices—including materials (e.g. objects and 'things'), textual resources (e.g. written plans and documents) and social technologies (e.g. groups of researchers and stakeholders; theories)—to produce new knowledge and practices through collaborations. We ask: What kind of educational processes (including action learning) support knowledge transfer in research and teaching institutions? In addressing this question, we describe processes that both planned (part of research design) and emergent (iteratively designed) and are characterised by: collective action, reflection and commitment;

people-place connections; specialist skills in knowledge brokering; and shared decision-making and resource investment.

Capacity building in the field of climate change adaptation - First experiences from a rural research and development project in Germany

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"Adaptation to climate change" as a new field of knowledge challenges agricultural and horticultural (vocational) education and extension. Farmers, horticulturists and other decision makers are confronted with vague scientific findings at best. A broad variety of global climate scenarios is "projected" onto regions and exact predictions are usually not possible. All too often, personal observations and experiences seem to contradict scientific assertions. Under this condition of insecurity actors must decide about future land use.

What does this imply for capacity building? How to transform insecurity into concrete educational measures and programs?

The authors discuss their first experiences within a German R&D network (INKA BB) in which they develop capacity building programs for various multipliers. Two examples from urban agriculture / urban gardening will serve as case studies. Strengths and weaknesses of the development processes and their management will be discussed.

Since the topic is complex and adaptation is a continuous activity, learning in connection with climate change adaptation ideally begins on elementary level, continues in higher and vocational education, and does not end with extension. In other words: "learning chains" must be developed which enable life-long learning in both, formal and informal learning environments.

Competencies are needed beyond classical technological and economic skills. "Gestaltungskompetenz" enables problem solving - from problem perception, analysis, generation of alternative solutions, to implementation and evaluation; with a key competence in critical analysis and reflection of contemporary research findings.

In INKA BB, participation is seen as axiomatic. As a consequence, an action-oriented, participatory approach has been chosen which enables mutual learning amongst partners from research, formal and informal, elementary, higher and vocational education.

Structures and requirements for scientific education coincide with innovative education management

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Visioning the "University of the Future" we need to face vocational education and school systems interlaced with a diversity of reform models in Europe. Innovative education management takes branch specific and online based approaches into account. The paper discusses the transitions, interlocking and permeability of educational domains deduced from German experience, taking European interaction into account. The discussion is focussed on issues such as universities´ autonomy, freedom of research and teaching and international equalisation of learning opportunities. The German discussion along universities and schools of the future, mainly concerning the aspect of higher education as a public good versus a contract good will be summarised in this paper. The role of universities and other higher education institutions for adult vocational training is derived by this discussion. German framework

conditions, new initiatives plus governmental arrangements and supporting systems will be described as an overview.

Innovative education management includes blended learning-approaches in conceptualising learner centred settings, based on education needs analysis and branch specific criteria. Learning online might be seen as a method for lifelong learning empowerment, if acceptance and media literacy is substantial available. Still societal and technical structures need to be adapted to achieve equal opportunities, access and usability for a wide range of rural learners, willing to use online learning offers. Online learning comprises many challenges for education concepts addressing adults in rural areas. Specific forms of electronically supported learning and teaching, required teacher skills and specific didactic methods addressing these stakeholders are focused as an outlook and research need in the paper. It mainly concludes outcomes from the 2010 IFSA workshop in Vienna on "Virtual realities and the future of distance learning in rural areas".

Upgrading the marketing education for sustainable food systems: the case of Finnish hotel and restaurant management degree program

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The hotel and restaurant sector represents a channel for sustainable food, reaching customers from local to global contexts. In marketing, the interpretation of sustainable food may be approached as 'local', 'regional', 'domestic' and fairly traded or through technical and socio-economic definitions and respective descriptions. However, to use this kind of marketing approaches, promising for territorial developments, the education needs to be based on scientifically elaborated understanding of sustainable food systems in order to lead to valid actions in business.

This paper refers to international research results regarding customers' understanding about and their relation to sustainable food. The implications of this relational understanding are used to develop a Finnish customized course for marketing sustainable food, to support future hotel and restaurant managers in their businesses.

The response by marketing education to customers' interest in sustainable food culture is developed on two axes. First, the students learn about how to use story lines supported by pictorial data when marketing various food items such as local specialties, fairly traded food or animal based products. Second, to communicate with customers expressing critical interest in environmental and socio-economic dimensions of sustainability of the services, the students learn about more conceptual and scientific expressions about sustainable food systems, such as carbon foot prints, economic structures and occupational wellbeing within food supply chains. The paper thus upgrades marketing education for sustainable food systems, whereby the effects of this kind of marketing education belong to future research agendas.

Learning from drivers and conflicts around bedded pack barns

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In 2007 a network of dairy farmers in the Netherlands were looking for alternative housing systems for dairy cattle. Researchers and dairy farmers shared ideas and looked abroad in America and Israel. This gave inspiration for deep bedded pack systems, but it had to be made suitable for the Dutch situation (climate). Therefore calculations and experiments where done on experimental and practical farms. The drivers for these housing systems were animal welfare and manure quality. During these experiments

and discussions with stakeholders conflicts appear like 1) more space per cow versus more ammonia emission and risk of nitrous oxide emission or 2) using waste materials as bedding versus food safety or 3) bigger building versus landscape. Much has been learned from international contacts, experiences and experiments on experimental and practical farms and talks with suppliers of housing layout, buildings aesthetics committees, architects, composting experts and policymakers. However, we are only at the start of the development and implementation of bedded pack barns, which are surrounded by many uncertainties. The experiences bring answers, but at the same time raise new questions. It is an ongoing learning cycle which is described by the DEED model. DEED stands for 'describe', 'explain', 'explore' and 'design' and describes the learning cycle and the factors involved. The network of dairy farmers involved in the learning cycle is very dynamic. A small group is monitored and evaluated on sustainable aspects. A bigger group of farmers, researchers and experts are involved in workshops and expert meetings to discuss the drivers and conflicts and find solutions. This learning process resulting in adapted management of the bedding and new designs will be shown.

Convenors:
Peter Kastberg, Hugo F. Alrøe, Henrik Moller, Bernhard Freyer, Karen Refsgaard and Jim Bingen

In order to develop better and more sustainable food systems, we need to make, and use, overall assessments of their effects, based on multiple criteria. This is a complex and very difficult task. Two of the main challenges are 1) how to balance very different types of assessments and avoid bias in favour of accurate knowledge and that which is easy to measure, and 2) how to communicate complex overall assessments in such a way they can be used in practice by different actors and stakeholders with different perspectives and values.

Food losses and wastage as a sustainability indicator of food and farming systems

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Food losses and wastage all along the food chain are estimated, at a global level, to amount to 30% of volumes produced (Lundqvist et al. 2008, Gustavsson et al. 2011). Whereas both industrialized and developing countries are affected, reasons and origins of these losses and wastage are quite different. Losses and wastage are highly unsustainable. In a context of growing world population and a rising demand for fertile land, clean water and energy, strategies for making better usage of natural resources will become essential.

We therefore suggest that the incidence of food losses and wastage be one indicator for the assessment of sustainable food and farming systems.

As for industrialized countries, we show that various technical, legal, fiscal and organizational barriers refrain from using food more economically and that high labor costs and a high level of standardization are major obstacles. In developing countries, loss reduction is hampered by a general lack of basic infrastructure, education and financing and requires innovation at a local scale.

Due to food system's complexity characterized by strong interaction of an important number of actors, supply chain thinking is essential in policy making for loss and wastage reduction. Going beyond farming systems, all stages need to be managed as a whole. Communication though should be tailored to actors' interests and highlight fields of specific gains they can achieve.

In the UK, strong awareness campaigns against food wastage at household level have cut wastage by 18% in 5 years (WRAP 2011). In France, an increase in the charges for effluents containing high organic matter levels has induced food industries to review their processes in early 2000. The role of indirect financial incentives for waste reduction should not be neglected besides direct campaigns.

In conclusion, multidisciplinary research, innovation and purposeful policies are needed to overcome barriers to food loss and wastage reduction.

Trust and credibility. A cross-disciplinary perspective on organics

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Existing research in organics emphasize the importance of trust and credibility and the role they play for different parts of the organic supply chain (e.g. Nilsson et.al. 2004; Bergström et al. 2005; Kottila et al. 2008; Pivato et al. 2008; Hofstede et al. 2010). However, organic research hardly offers an answer to how trust and credibility in organic products are created and maintained.

The overall purpose of the proposed paper is to approach the complex relation between consumer and organic products from respectively a media and a management perspective. In the

proposed paper, we want to discuss how the creation and maintenance of trust and credibility is approached and conceptualized in the two fields? How can they be combined in order to enhance our understanding and improvement of the trusting relation between consumers and ecology in a complex environment?

The paper crosses disciplinary boundaries, as it is a collaboration of two independent projects under the research program MULTI-TRUST. Karen Klitgaard deals with examples of media research in credibility and trust. She discusses perceptions of organic food products in digital and other media. Iris Rittenhofer explores how management research deals with trust and credibility and in relation to stakeholders.

As the projects are still ongoing, we do not yet know the final outcome. Based on the expected results, for the conference we will prepare three major claims related to the questions: What are the tensions in the two disciplines conception of trust and credibility? Are trust and credibility related, and if so, how? And what does this tell us about consumer' perception of organics? In order to facilitate prolific exchange with the workshop participants, we will finally identify and frame three discussion themes.

From evaluating sustainability performance to supporting agricultural management: case of intensive grazing versus zero-grazing dairy systems

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We performed an integrated evaluation of the sustainability performance of 10 intensive grazing and 10 zero-grazing specialised Flemish dairy farms, using a selection of sustainability indicators from MOTIFS (Monitoring Tool for Integrated Farm Sustainability; Meul et al. 2008). We put special effort in formulating useful management advice for farmers of both groups. Therefore, we used multiple regression to identify the most influential factors (independent variables) for each indicator value (dependent variable) and, through correlation analysis, related the selected factors to specific farm management indicators such as farm intensity or concentrate use; they were used to formulate general management advice. More detailed site- and case specific advice was delivered to the 20 participating farmers through an extended feedback report including a detailed representation of the MOTIFS results and comparison of the farm results to the means of the grazing and zero-grazing group. Afterwards, all farmers were invited to participate in a discussion group with the researchers, farm advisors and an invited expert. Through this approach, we addressed the suggestions made in previous validation studies of MOTIFS (Meul et al. 2009; De Mey et al. 2011) (i) to combine a detailed analysis of the sustainability indicator values with an intensive interaction between researchers and farm advisors and (ii) to support social learning among farmers through a discussion meeting with an invited expert. This allowed us to focus on the essential farm management aspects with the highest potential to increase farm sustainability and to provide a better translation of the indicator results into practical advice for farmers.

The trade-off between scope and precision in sustainability assessments of food systems

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During the last years, many different tools have been developed for assessing aspects of sustainability in the food sector. As these tools greatly vary in scope and precision, they may come to different assessment results for the same problem, which confuses farmers, policy makers and consumers alike.

Thus, a main reason for this confusion lies in the inconsistent understanding of the notion "sustainability" and in the depth of analysis. The aim of this paper is a) to classify assessment tools that can be used at farm level according to the type of parameters and the level of detail with which they assess sustainability and b) to evaluate the suitability of different approaches (e.g. the RISE-Method and detailed life-cycle assessments) for assessing sustainability for different purposes.

Sustainability assessments can be classified according to the environmental, social and economic aspects they take into account. They are usually conducted for advisory purposes, certification schemes, or as purely scientific assessments. In the context of sustainable food production, assessments can be conducted at farm, product, supply chain or even agricultural sector level. This variety of circumstances for sustainability assessments implies that different tools are needed for different occasions, addressing either intrinsic or extrinsic motivations of farmers. Furthermore, tools require different benchmarks and indicators when applied in different regions. Thus, one size-fits-all soultions are rarely feasible. In principal, a trade-off between scope and precision can be detected when comparing different tools. However, despite this trade-off, scientists and other stakeholders should seek to harmonize the basic principles of sustainaiblity assessments. Thus, contradictions between assessments with different tools can be widely circumvented, which will facilitate the interpretation of results of sustainablity.

AVIBIO: a method and assessment tool of the sustainability of the organic poultry industry

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The French organic poultry sector is facing new challenges and issues for its development relating to aspects of global, European and national contexts and also to the specificities of each region of production. In order to evaluate what is required to meet the increasing demand for organic poultry, while moving towards sustainable production, a method to assess sustainability at the production line scale was carried out. Four regions were studied: Brittany and Rhône-Alpes for eggs, Pays de la Loire and Aquitaine for chickens.

A participative approach was undertaken in order to promote exchange between the various players who are involved directly or indirectly in the production chain (production organizations, farmers, professional unions, researchers, local authorities, etc.). Different stakeholders (98) were questioned about their opinions on the conditions of sustainable production. In a second phase, the results of this first survey allowed a representative group (21) to draw up the main- and sub-objectives of sustainability (principles and criteria respectively).

Economic	Social	Environmental
Generate and safeguard income, and share added value between stakeholders	Meet citizens' expectations	Minimize the use of ressources
Guarantee supply and market access	Ensure the sustainability of production tools	Reduce pollution
Enhance local employment	Strengthen the local network	Enhance biodiversity

For each sustainability component (economic, environmental and social), indicators were fixed based on criteria which refer to the principles corresponding to the stakeholders' representations of sustainable development. A scoring scale was attributed to each indicator: high scores corresponding to the objectives being met. Scores were added per criteria, objective and component. For the four regions, the final evaluation highlighted five ways of improvement and serves as a decision-making tool for the different stakeholders: develop access to organic raw materials for poultry feed, improve technical aspects and logistics in the production chain, improve communication within and outside production chain, increase organic poultry products in the collective restaurants and develop practices that enhance biodiversity.

Assessing the economic, environmental and social characteristics of UK farming systems

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Agricultural land supports the production of food, fibre and fuel using multiple farming system; these range from small organic family farms to large conventional industrial units. These diverse systems provide an ever changing landscape in which researchers are attempting to find an optimum approach to balance production against other economic, environmental and social parameters.

The UK Government has commissioned a three year project to develop methodology to assess the economic, environmental and social characteristics of UK organic and conventional farming systems. In the first year, the project team described the complete range of current UK farming systems, from intensive arable production to extensive livestock, both organic and conventional, and described thirty-two systems to cover the majority of all UK farming systems. The project team also described forty indicators to cover the economic, environmental and social characteristics of those farming systems. The economic indicators are developed from the UK's Farm Business Study, the environmental indicators from the Cranfield University's LCA model and the social indicators from previous UK studies.

The second year was occupied data collection to support the chosen indicators. The project is now in its third year and is exploring approaches to bring these diverse indicator sets together to assess the benefits and dis-benefits that may accrue to different farming systems and how the results can be used to increase the sustainability of farming systems whilst reducing resource use and maintaining biodiversity.

The project is using different reporting and functional units to provide answers to different farming system scenarios. The approaches have already been presented to UK focus groups but we would like the opportunity to present to an international audience so that their feedbacfeedback and analysis can be incorporated into the final methodology.

Knowledge Communication Theory Revisited – from 'communicatio' to 'communis esse'

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This paper reflects directly on the 2nd challenge, as described in the workshop programme, i.e. "how to communicate complex overall assessments in such a way they can be used in practice by different actors and stakeholders with different perspectives and values."

Going somewhat back to basics, as it were, philosopher Bertrand Russell stated that there are two kinds of people: those who produce scientific knowledge and those who consume it. Even if such a dichotomization is by no means unproblematic, it is – nevertheless ¬– not altogether untrue. The very fact that this workshop is concerned with how complex assessments may be communicated in such a way that actors and stakeholders, other than the producers of said complex assessments, may be able to utilize it, substantiates that. From the point of view of sociology of knowledge this dichotomy may, in many ways, be seen as a byproduct of an ever increasing specialization of scientific disciplines, and – consequently – of the knowledge(s) they produce.

The research field which has this dichotomy, gap or asymmetry as its object of study is known under such names as Public Understanding of Science, Science Communication, Science and Technology Studies and the like. Different though they may be, the common denominator of these disciplines is an appreciation that the relationship between science and public, prototypically

personified as the relationship between the expert and the lay person, is in many ways a conflictuous one. Even if what is deemed problematic may be seen from a myriad of perspectives (e.g. gender, culture, power, status, 'capital' etc. etc.) the ur-point of departure, so to speak, is the idea that between the expert and lay person – or in the sense of Russell: between the producer and the consumer of scientific knowledge – there a) exists a knowledge imbalance and that b) this state of social affairs in not advantageous to the lay person. In my presentation, I will address and discuss this problem as a knowledge communication problem.

In order to situate my discussions, I will apply a catalogue of three distinct approaches to communication to examples from the MULTI TRUST deliverables. This, in turn, entails that the aim of my presentation is to add to the ongoing process of negotiating what questions we may ask – and what answers we may hope for – in order to be able to design an approach to communication which would allow the MULTI TRUST project to communicate "in such a way [that the findings and insights] can be used in practice by different actors and stakeholders with different perspectives and values."

Assessing the role of values in food systems

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Value is a key concept for understanding how food networks function because values determine what actors perceive as good/bad or right/wrong, thus value must be given a significant role in assessing and balancing the effects of organic food networks. At the same time value is a loose concept, widely used and with various meanings in different scientific perspectives, in which ontological difference produces different perceptions of what values are. The perspective which is chosen thus has important implications for the analysis and for the outcome of the assessment of the food network. With this paper I will assess how three different perspectives understand values, how values arise, are absorbed and mediated in the food networks. The analysis will function as a part of my PhD project on the values and knowledge in organic food networks. I will thus consider three perspectives which predominate in the analysis of food networks, 1) values placed with the subjects (e.g. Convention Theory), 2) values placed with the object (e.g. Behaviorism) and 3) values placed in the relation between subject and object (e.g. ANT and Economic theory). I will compare the different perspectives with regards to how values arise, are absorbed and mediated in the network and assess the analytical implications hereof. In the end I will discuss how a network analysis can be adapted to manage the complex concept of values.

My food chain: intensification of sustainability orientations by virtual tools through anticipatory network dialogues

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Food is simultaneously both an extremely mundane and intricate matter for the actors within the food system. The confidential, 'silent' and unknown aspects of social and environmental reality around food suggest circumstances, under which changing food systems towards sustainability is extremely challenging in terms of communications mediating 'practice shaping' concepts. Because there is scarce evidence regarding existing food systems' balanced 'tripods' of sustainability, and because this illustration cannot be inserted as such into other food systems, it seems more productive to make use of the conceptual entity of sustainable food system as a generically disseminated frame and direction for co-development of running food systems by their actors and researchers.

This paper sets to outline the necessary conditions for systemic and creative co-development of sustainable food systems from the scratch. The outline starts from the functional unit of the system, identified as the economic relations between the food chain actors, branching off into networks. These relations are seen to entail additionally the social dimension as well as the environmental one. The conditions for advancement have been identified as anticipatory network dialogues, allowing sharing of knowledge and creating new modes of activities, increasing transparency of socio-economic relations and learning about contextual environmental impacts. The communicative challenge pertains to rendering these features intelligible for actors within the system by offering them modelled virtual knowledge about the reality for corrective and creative actions. The incremental and stabilized demand, allowing iterative 'loop' developments through economic, social and environmental relations is hypothesised to end up in over-all sustainability kernel within larger food systems.

Slow Food Presidia: a sustainable agro-food systems?

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The aim of our study is to develop an indicator-based monitoring tool for sustainability of Slow Food Presidia, taking into account economic, ecological, social and cultural aspects. The SF Presidium project is not simply promoting a "conservative" development model, where the local capital formed by the natural and cultural resources are preserved. They are a model of re-interpretation, redistribution and re-appropriation of use valuesand resources inherent in the local area starting from the interactions of the latter with thelocal and global context, the specific dialogue between endogenous and external stimul.

Methodological steps were considered: (i) translating the major SF principles of Good, Clean and Fair into concrete and relevant themes for sustainabilit issues; (ii) designing indicators to monitor progress towards sustainability for each of those themes; and (iii) applying the monitoring tool on some SF Presidia, as a first attempt at end-use validation. Stakeholder participation and expert consulting played an important part in each of these methodological steps. Results of the multi objective sustainability evaluation of some SF presidia are shown .

Reflexivity or assessment? The role of self-reflexivity in the assessment process

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If ours is a "postmodern" world, then it is one in which our freedom is constrained by ubiquitous assessment tools, evaluation reports, controls, and continuous, but often concealed oversight. With respect to our food as well, we live in a world of seeming countless protections and controls, all designed to secure high standards in food quality. At the same time, recent disasters (Fukushima) or recurrent scandals in the organic food chain remind us endemic failures or "normal accidents" and the questionable moral grounding in our food system.

In this paper we explore the need and possibility for analytic approaches that encourage and support stakeholder reflection and development of the ethical foundations of food and farming. This analytical approach includes three dimensions: the IFOAM principles, systems theory and transdisciplinary concepts.

The ethics of IFOAM principles offer a framework for self-reflexive processes and guidelines for a self-reflexive framework within which to develop more individualized ethical approaches to thinking about food and farming. Systems theory helps identify and sensitize us to the nature, and

extent of personal and organizational impacts on human, cultural, economic and nature environment. Transdisciplinary concepts concerning ethical values and practices represent one means for thinking about "acting responsibly" and understanding that ethics are not (or should not be) "top down", but emerge in a participatory context.

We argue that strengthening self-reflexivity is a key towards a healthy agriculture, food and healthy environment that obviates the need for external controls and regulation.

Organic farming and multicriteria decisions: An economic survey

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Shifting from traditional to organic farming and food consumption might impact biodiversity, health, agricultural productivity, animal welfare, the environment, food quality and other important variables. Many of these changes involve what economists call market external effects and public goods; these are effects which are not directly paid by either the producers or the consumers in the market. From an economic point of view, these effects constitute the key justifications for public interventions in the market in the pursuit of socially optimal allocation of resources. Interventions can take the form of imposing taxes, subsidies, minimum standards and even rules for public consumption. Identifications of optimal policies require that all aspects of a change are included.

Economists have worked with such multidimensional decision problems for decades and a number of rather effective methods have been developed. The traditional method, at least for relatively small projects is the cost-benefit method where all cost and benefits are measured in money. However, cost-benefit analyses are based on a considerable number of simplifying assumptions and less restrictive "multi criteria decision methods" have been developed. There are ongoing discussions of how to design the single optimal method. This is possibly because multicriteria decision problems are on the borderline between economic science and policy. Nevertheless, economists can contribute withf methods and considerations which can make the decision making process significantly more rational and highlight the trade-offs at stake.

The paper provides an overview of the economic theory of multi criteria decision making and discusses both theoretical and practical problems related to the use of such methods. Examples of studies treating traditional and organic farming are given. Interesting results are found; e.g. indications of conflicts between the benefits as perceived by consumers vs. documented by science.

Stakeholders and the challenges of sustainability assessment

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In order to develop better and more sustainable food systems, there is a need to make overall assessments of their effects, and to bring those assessments into practice. This paper will identify key challenges in developing and using overall assessments of the effects of food systems on the environment, nature, health and welfare, focusing on the role of actors and stakeholders in meeting these challenges. The case in question is organic food systems, but the analysis is also of broader relevance. The three pivotal challenges concern knowledge, values and communication. The first challenge is how to use and balance different types of knowledge. The effects of different developments can be assessed based on local knowledge of practices and histories, indicators on environmental presures and states, scientific system models, etc. Different sciences and different actors can provide different kinds of knowledges. Some are quantitative and precisely measured, others qualitative and narrative, some easily accessible, others costly or difficult to obtain. The second challenge is how to render values visible and bring the relevant values into the assessments. Scientific

perspectives are based on certain value-laden problems, questions and concepts, indicators have built-in orientors, assessment systems are based on value-laden selections and reductions, stakeholders have different values and interests, organic agriculture has explicit ethical principles, and society has a range of objectives of relevance for food systems. The third challenge is how to communicate complex overall assessments in an effective and participatory way. This is needed by researchers and stakeholders in the development of assessment tools, by producers and other actors in the development of better organic practices, and by public authorities in the development of appropriate policies for organic food systems. Reduction of complexity, visualisation, and media all play a critical role in this.

The role of values in multicriteria assessment methods

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In order to develop better and more sustainable food systems, there is a need to make overall assessments of their effects, and to bring those assessments into practice. One of the main challenges in this is the role of values. In organic food systems, in particular, values and ethics play a clear and important role. Furthermore, all multicriteria assessments are based on value-laden selections and weigtings of criteria, and the chosen indicators are connected with orientators that distinguish good changes from bad. It is therefore important to clarify how values and ethics enter into the assessment process, so that assessments and decisions can be made in a way that supports the development of organic agriculture. This paper will analyse where and how values and ethics enter into different methods for multicriteria assessment and communication, identify the explicit and implicit built-in values in concrete multicriteria assessment tools, and compare them with the specific ethical principles, values and objectives that characterize organic production and consumption.

A comparison of complex expert-based assessments versus quickscan assessments

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Past decades, several sustainability assessments emerged, ranging from very complex expert-based assessments to quick scan ones. The former type is based on expert information and an extensive data demand, the latter on information gathered instantly from the farmer. This research compare both types while using the following criteria: i) the design approach and characteristics; ii) the critical succes factors for implementation put forward by De Mey et al. (2011); iii) results in the field and evaluation by the end-users. As an example for an expert-based assessment, we used MOTIFS (Meul et al. 2008) designed for dairy farming in Flanders. We applied this tool on Flemish dairy farms within the EU-Interreg project DAIRYMAN. The OCIS Public Goods tool (Gerard et al. 2011), designed for organic dairy farms in Great Britain was used as example of a quickscan method. During the EU project SOLID, the tool was adjusted for the entire European region and applied on organic dairy farms. This research determines the strengths and weaknesses of both types of sustainability assessment systems including the method of application, resulting in suggestions on which type of sustainability assessment is relevant depending on the case (related to the critical succes factors such as attitude of model users, time and data availability, user friendliness, communication aid,…). Researchers and practitioners can use this information when developing or selecting, and possibly modifying, an appropriate tool for their goals.

Multicriteria assessment of scenarios for a sustainable, biobased economy balancing food and bioenergy production

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The development of a new biobased economy, balancing ecologically sound and sufficient production of both food and bioenergy is defined by the European Commission to be one og the largest challenges for agriculture in the 21st century. Based on results from ongoing research projects, including the projects on "Multicriteria assessment and communication of effects of organic food systems (http://multitrust.org/)" and the Velux Foundation project on "Consequences of large scale bioenergy production in Denmark on biodiversity, forestry, and agriculture in the context of sustainable development" scenario generation techninques are presented. This includes the techniques for the derivation and mapping of indicators for a sustainable development within both the economic, social and ecological dimension. Based on real case studies from scenarios carried out for Danish agriculture 2020 and 2050, a discussion of how such techniques can help to qualify dicision-making at different scales are facilitated.

Theories on motivation and their implications for supporting communication, learning and decisionmaking in relation to organic food systems

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Efforts to promote communication, learning, decision making and change of individual and/or collective practices in relation to sustainability issue imply more or less explicit theories on agents and what motivate them to act. According to the “economic man” assumption producers and consumers act exclusively as self-interested economic agents maximizing profits and utility respectively. In combination with the free rider assumption this implies that public good characteristics of organic products (reduced pollution, enhanced animal welfare etc.) would not affect consumers’ demand and willingness to pay for organically produced food. However, emperical evidence indicates that this approach does not fully describe farmers’ and consumers’ behaviour when it comes to organically produced food products. Social science offers a body of alternative theories which may help to explain the motivations and behaviour by various agents affecting the organic food system.

These theories differ in their way of understanding human subjectivity, social dynamics and the role of motivation in processes of social change. These differences include issues like the rational vs. irrational character of the human mind, cognitive-individual vs. interactive-contextual approaches, and linear-causal vs multi-factoral/dialectical approaches. In social science these differences are found in economics, psychology, sociology, STS-studies etc.

The aim of the session, we are proposing here, is not to confront these different theories in general in order to come closer to a general theory on motivation. Rather we would like to focus on different agents and their motivations in relation to organic food systems - in their own practices as producers and consumers or as participants in communication, learning and deliberations with other agents. What do we know about that? Which theoretical approaches on motivation have been used to gain this knowledge? What alternative approaches might be applied? And what consequenses might this knowledge and these approaches have for the development of designs aiming at supporting communication, learning and decision-making related to organic food systems?

We propose a 1½ hour session on this issue starting with four ten minutes presentations rooted in respectively economics, psychology/socio-cultural studies, system theory and science-technology-studies (STS). They will be followed by two rounds of discussion, the first on whether these or other

approaches can help us to understand agents and their decision-making in relation to organic food systems, the second on whether they can guide efforts to communicate and promote learning and change processes on this issue.

Convenors:
Götz Uckert, Ruth Delzeit and Harry Hoffmann

Bioenergy development has gained widespread momentum in the last decade. Although it has been severely contested as a challenge for climate change and food security, bioenergy systems are still a factor in global agriculture. This workshop will focus on systemic approaches which hold the capacity to synchronically allow sustainable food production and open up opportunities for bioenergy development or vice versa. The question we want to answer is: Can, and if how, both production pathways be harmonised to meet the globally rising demand for food and energy? Contributions focusing on both developing and developed countries are welcomed.

Spatial Analysis of Food Insecurity Drivers and Potential Impacts of Biofuels Cultivation: A Contribution to Sustainable Regional Development and National Biofuel Policies in Kenya

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The global increase of biofuel production and demand raises concerns about possible negative impacts of this development on food security. Competition for arable land and rise or fluctuation of food consumer prices are seen as the two major risks caused by biofuel investments for the food security of vulnerable communities and households in developing countries. However, reasons for food insecurity are multidimensional and not always related to the volume of food production or the consumer prices of food items. Therefore, understanding the various drivers of food insecurity is necessary to understand possible future impacts of biofuel development on food security.

The aim of this paper is to identify, map and understand the most critical drivers of food insecurity at national scale in Kenya as a basis for more differentiated rural development and biofuel investment policies. Based on literature review and expert discussions a definition and classification of drivers of food insecurity, which is adapted to the Kenyan context, was developed and used as a basis for field work. A participatory mapping was conducted with local authorities and resource persons in nineteen locations in Kenya to establish a spatial model of food insecurity levels and drivers.

First results show that levels and drivers of food insecurity in Kenya are multi-dimensional and associated to several economic, ecological, socio-political, socio-cultural and land use management related factors. Food insecurity in the arid areas in the north of the country is mostly severe and is mainly due to rainfall variability, lack of support from the national government and violent conflicts, mainly between pastoralists over grazing areas. In the semi-arid lands in the south-east of the country, food insecurity is moderate to acute and is mostly associated with inappropriate land use management and production systems, but also with rainfall variability. In the south-west of the country, food security is mostly much better, especially in the high-potential areas in the central and western highlands. Where food insecurity occurs, it is mainly associated with land use management and overpopulation, which increases pressure on natural resources, unrest and violent conflicts in the areas affected by the 2008 post-election violence and adverse economic situations.

Intervention in view of mitigating food insecurity has to happen at various levels. In the north, stronger commitment from the national government, efforts by local leaders to mitigate violent conflicts, and adaptation of rural households of their livelihood strategies were identified as main pathways towards improving food security. In the south-east, water management and agricultural practices need to be improved and further adapted to the variable climatic conditions. These efforts can be supported by extension services and other development agents. In the south-western part of the country the situation is more complex and therefore multiple levels of intervention are needed in most areas, mainly to improve agricultural practices, mitigate violent conflicts in areas with high pressure on land resources and strengthening the economic development of marginal areas.

These findings lead to the conclusion that reasons for and mitigation of food insecurity is highly context specific and can not be addressed through simple solutions. They also indicate that the potential impacts of biofuels on food security are likely to be very different from one area to the other. Sustainable biofuel policies must therefore take this diversity into consideration to identify the adequate solution for each area.

Impact of Jatropha curcas (JC) on local food security in Kenya

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Jatropha curcas has been introduced in Kenya with the hope that it will provide smallholders an additional income and boost rural development. Yet, high expectations were revised downwards and questions surged about potential negative impacts on food security. Initial research in 3 food insecure case study sites revealed that jatropha is currently not negatively affecting food security as it is only cultivated by food secure farmers who consider it as a venture crop. Nevertheless, as a matter of precaution jatropha should not be planted on plots and instead priority should be given to hedges or food crops in order to avoid negative impacts on food security.

Relevance of sustainable agroforestry for smallholders – a quantitative approach

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This paper aims at investigating quantitatively the relevance of sustainability of agroforestry for smallholders using the example of firewood in rural Tanzania. Three questions are addressed: (1) To what extent do households behave sustainably regarding firewood extraction from own agroforestry? (2) Are sustainably behaving households better off in terms of income? (3) Which factors determine sustainable behavior in agroforestry? The analysis is based on a cross-sectional data set of 314 households from Tandai village in Morogoro region, Tanzania in 2010. The empirical evidence from a quantile regression shows a negative effect of sustainable firewood extraction on per capita income for the poorest percentile and a positive impact on per capita income for the richest percentile of households. In the percentile of the poorest households are those better off who harvest more firewood from agroforestry than the regeneration rate of trees provides in order to maintain their standard of living. In contrast, households in the upper income percentiles can afford to extract firewood below the growth rate of trees due to opportunities of firewood substitution. The results of the logistic regression show that land property rights and environmental awareness of the importance of natural resources increase the probability of the sustainable use of agroforestry product.

Sunflower for horsepower – potentials of locally embedded biofuel production and consumption in Laela, Western Tanzania

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The comlex issue of biofuel production has, on a global scale, increasingly become politically contested especially due to the debates about "food versus fuel" and "land grabbing". In this context are the vast majority of produced biofuels used for transportation purposes in industrialised and/or BRIC countries.
In parts of rural Africa, another option for biofuel consumption might offer potentials to overcome the political stumbling blocks by simultaneously triggering rural development: Biofuel based decentralised electrification. Ideally, the biofuel value chain is in this concept completely locally embedded, leaving the surplus mainly with the small-scale farmers.

In the village of Laela in Western Tanzania, sunflowers might hold the potential to serve as sustainable source for electrification. Currently, fossil fuels are imported at high prices to this remote village to power mirco generators leading to comparably high energetic losses. At the same time, the sunflower yields are sold in the harvesting season for marginal surpluses to traders and middlemen - those are the ones who profit most. The utilization of those locally produced vegetable oils for a centralised electricity generator might combine higher prices for local farmers (as transportation costs become obsolete) with a minimisation of energetic losses as only one combustion engine is used.

Although Tanzania is, as a nation, a net vegetable oil importer is the overall situation more complex on the local scale. Therefore, one major question to discuss with the workshop participants is the interrelation between national food security issues and options which do favor the small-scale producers most.

Convenors:
Marc Tchamitchian, Stéphane Bellon, Ika Darnhofer, Cristina Micheloni, M. Ramos and Pierre Stassart

Organic farming is conversely challenged by both an increasing commodification and its ability to produce public goods. This workshop addresses this challenge along the following three topics: (i) design principles and experiences of innovative farming systems, (ii) reproducibility and sustainability of organic farming systems (adaptability, resilience, reversibilities), (iii) relevant levels of organization to merge the previous issues (tradeoffs among productive and environmental dimensions, upscaling and co-existence of models…). An added value is to contribute todefine a research agenda.

Towards multiple-play in organic farming: co-producing food and public goods

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Organic systems are challenged by an increasing demand to produce both food and public goods. Under this manifold pressure, organic systems take different routes from the traditional ecologically based organic systems to conventionalisation. A third a more complex route may exist which would address these different socially assigned goals. However, the structure and the processes of such systems remain to be defined, as well as their properties, whether productive, economic, ecological, ecosystemic or social. From this characterization it should be possible to assess whether producing food and fullfilling environmental goals are contradictory goals or may be combined for the better, and will give clues on how to design such intensified organic systems, on which biological processes they must be based.These results may also contribute to clarify what ecological intensification is and how to put it to work in practice.
This presentation focusses on the questions raised by these trends and the search for an alternative route. These questions deals with the design of new organic farming systems, their sustainability and reproducibility. They also deal with the scale at which design can be foresee, with the hypothesis that more degrees of freedom for the design of new organic farming systems may be found if the relationship and landscape organizationof these systems are also considered. As such, this presentation aims to be an introduction to this workshop.

Conversion to organic farming and consequences on work organisation and work perception

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With 3% of agricultural area conducted in organic farming, France will not reach its objective of 6% of agricultural area converted to organic farming in 2012. Work surplus (real or supposed) seems to act as a brake to conversion, while French farmers often seek to reduce their work constraints. The aim of our study is to identify changes that happened during transition to organic farming on the farm, and to understand their consequences on work organisation and farmer's work perception. 18 surveys were conducted in Rhône-Alpes region on dairy farms and cereal farms converted to organic farming for about ten years. Changes are due to organic farming specifications and to technical and economic adjustments. They are sometimes also linked to the management of isolation (from the local farmers' community, from the former advisory and marketing networks). Changes are various, depending on

productions and processing system organisation, and on farmers' projects and expectations. Transition to organic farming doesn't always mean a surplus of work. Nevertheless it often causes important work organisation changes. In many cases, it leads to a new dynamic in which work perception and work expectations will change and have an influence on farming systems transformations.

Transition to sustainable agriculture: How reframing the meaning of organic farming contributed to its growth in Austria

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Although organic farming has seen a strong growth in the last two decades, in most countries it still covers only a small share of the agricultural land (in the USA: 0.7%, in the EU: 4%). However, currently in Austria 20% of agricultural land is certified organic. The aim of this contribution is to analyse how changing the meaning of 'organic' contributed to this development.

To enable a transition, a broad range of social, political and technical factors need to align. The development of organic farming in Austria is thus not reduced to an economic explanation (e.g. subsidies offered). Instead, the complex interplay of social norms and values, geo-political developments, agro-ecological opportunities, entrepreneurial individuals, collective action and governance structures is analysed. Our analysis is based on the conceptual framework established by the Dutch School on transitions (Frank Geels, John Grin and others).

The contribution will focus on how the meaning of 'organic farming' was transformed in the course of the transition and discuss to what extend this transformation of meaning was what made organic farming – originally an alternative production method and thus defined in opposition to conventional farming – acceptable to the mainstream. Indeed, organic farming needed to become an attractive opportunity for agricultural policy makers, and acceptable for the societal actors involved in agriculture (e.g. the chamber of agriculture). It also needed to loose its 'müsli' flair (i.e. healthy but tasteless food) to become appealing to new consumer groups. Through reframing what organic farming and food means, it became attractive to a wider constituency, allowing it to seize an 'window of opportunity' (the fundamental change in agricultural policy linked to the EU-accession of Austria). The analysis will thus show how (the meaning of) organic farming was transformed in the course of the transition. Indeed a transition changes the niche as well as the regime.

Soil conservation practices in organic farming : overview of french farmers'experiences and contribution to future cropping systems design

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In organic farming, as crops production is directly depending on the smooth functioning of soil, farmers pay attention to preserve soil ecosystem in order to benefit from better ecological services. Today, soil conservation practices, as ploughless soil tillage and cover cropping, have gained prominence in organic cropping systems and provide for great potentials such as maintaining or increasing soil fertility, saving labour and reducing energy costs.

This paper focus on pioneer organic farmers who integrated or tended to integrate soil conservation practices into their cropping systems. The aims are (i) to understand how these new combined practices are managed in relation to farmers' objectives and constraints and (ii) to identify difficulties encountered by farmers and how they deal with it. This work provides a reference base for designing new organic cropping systems.

Our study was based on 24 semi-structured interviews with farmers, having diverse production systems and different levels of experience. They were located over France in various pedoclimatic situations.

From these interviews, we developed a typology which was based on the frequency (occasional or systematic) of the use of both ploughless soil tillage and cover crop along the crop rotation. Four differents strategies were obeserved. We found several factors to explain the diversity of strategies : (i) pedoclimatic conditions, (ii) biotechnical management (e.g. nature of crops, weed infestation or equipment availability) and (iii) farmers'objectives and ideals (e.g. risk taking or facing new challenges).

Understanding these factors is key issue for adopting soil conservation practices in organic farming. That's why these pioneer's experiences will be shared with others farmers, in a participatory research project, to find suitable solutions for future sustainable organic cropping systems.

Proposing indicators to facilitate the conversion to organic vineyard farming: an integrated analysis

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Conversion to organic vineyards has greatly increased in France over the past five years (+ 20% between 2006 and 2008, Agence bio) although if they are not easy to perform depending on the biophysical or economic context. Knowledge and tools to facilitate the conversion are lacking. In the three-year project AIDY (Integrated Analysis of the DYnamics of the conversion to organic vineyards), we proposed to identify indicators to facilitate the conversion to vineyard farming. This project analyzed the trajectories of vineyards conversion to organic farming considering different dynamics:

- biophysical (soil, crop, pests…),
- technical (field to farm scale),
- socio-economical.

A conceptual model of vineyards in conversion (CmA) at the field scale and farm scale was elaborated for the problem to be addressed which makes explicit the links between the crop management system, the biophysical processes and the system's performances. This allows the integration of various types of knowledge.

Three types of indicators were collected in the project for analysis, management and assessment. Each indicator was defined throughout a normalized protocol. It gave information on a component of the vineyard system and its dynamics. It was characterized by its uses, pertinence, protocol of measurement and interpretation and by its position regarding the CmA. This relation was a way to associate an indicator, described like a tool, to the knowledge-base on the functioning of the system. The identification of indicators is based on four methodologies : expert knowledge elicitation and conceptual modeling (CmA), farm surveys and in-field experiments. More than 70 indicators have been identified up till now.

The research group is interdisciplinary (soil science, pathology, entomology, agronomy, sociology, economy...) associating various stakeholders.

The methodology we proposed in Aidy is promising, with improvements still needed to ensure the organization of the whole set of indicators.

Species diversification in market-garden farms and consequences on crop management, labour organization and marketing at the farm and territorial scales

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Most of the market-garden farms which converted to organic farming (OF) in the last decades are small-area diversified farms. Larger farms are usually specialised on a few vegetable species and frequently face technical and economic problems when they convert to OF. Diversifying production on medium and large farms may be a way to increase their sustainability because of larger crop rotations and varied marketing outlets. The increase in the number of species has various implications on farm management and sustainability, especially on labour organization and marketing. In this study we questioned how an acceptable degree in species diversification may be a potential lever to develop organic vegetable production. The study is based on multidisciplinary surveys carried out by sociologists and agronomists from INRA who compared market-garden farms in South East France varying in usable surface area and diversification degree. The article describes the various forms and dynamics of diversification either based on the increase in the number of vegetable species or on the combination of market-garden with arable crops, orchards or vineyards. The consequences are observed on (i) crop management (with a specific focus on the link between crop rotations and pest control), (ii) labour organization (especially knowledge and skills, division of tasks, use of hired labour) and (iii) marketing implications (with a specific focus on how collective marketing networks may be combined with individual short marketing chains). The results are analysed not only at farm level, but also at territorial level, as collective marketing initiatives, replacement services and cooperative use of agricultural equipments might be driving forces to facilitate the diversification process at farm level. The article concludes with theoretical considerations on the potential innovative organisations that could facilitate the transition to OF within the agrifood system.

Sustainability of organic and conventional beef cattle farms in SW spanish rangelands ('dehesas'): a comparative study

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Organic production in Spain has increased substantially in recent years due to several factors, such as the growing interest of the EU towards preserving sensitive ecosystems; the potential role of organic production in the development of rural areas and the growing consumers' demand for safer and higher quality foods produced under ethical and environmental standards.

Within this framework, this paper analyzes the beef sector of SW Spanish rangelands (dehesas). These are traditional systems characteristic of the Iberian Peninsula where native herbaceous vegetation and evergreen species of Quercus provide the basis for extensive beef farms. These systems have a huge ecological value, and the livestock systems that are based in them are of vital importance for their sustainability.

Although traditional beef farms in this area show low stocking rates and a small dependence on foodstuff purchases, the Common Agricultural Policy has led to certain changes. On the one hand, some farms have become more intensified, as a way to maximize the revenues from the CAP subsidies. On the other hand, many farms have turned to organic production, trying to take advantage both of new subsidies and of new market trends.

With this study, we try to evaluate the sustainability of conventional and organic beef production systems. It will allow us not only to forecast the chances of survival of farms, but also how to fulfill the

society's demands mentioned above, taking into account the farms' characteristics and sustainability, the specific conditions of the region under study, the market trends and the new scenario with the upcoming CAP. To this end, we apply a methodological adaptation of the MESMIS methodology to 90 dehesa beef farms. MESMIS is based on the evaluation of basic attributes of sustainability that allow one to make a simultaneous and comparative analysis of different types of farms.

The sustainability of an organic sector under transition: an empirical evaluation for Italy

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The Italian organic sector since its origin has been going through a deep process of transformation. More in detail, many organic farms experienced an increase in size, an industrialization of production processes, a gradual integration within the traditional food system – such as the use of large scale retail channels and brands, coming along with a weaker defense of the original principles stated by IFOAM. This resulted in the so called conventionalization of organic farming that led to increasing doubts about the environmental and social sustainability of conventionalized organic farms. A large debate on the conventionalization of organic agriculture spread out especially in Europe.

The aim of this work is to contribute to this debate by comparing the sustainability of organic and conventional Italian farms. In the first part of the work we analyze the evolution of the Italian organic sector, since its origins till the penetration in the large scale retail, on one side, and the development of other agricultural competitive regimes – i.e. Alternative Food Networks - on the other side. In the second part of the work a short description, based on the FADN data, of the organic agricultural sector in Italy will be presented. In the last part of the work we propose a methodology to evaluate the environmental, social and economic sustainability of organic farms and apply it to the FADN data. Simple indicators for each of the three levels of sustainability –social, environmental and economic- are first calculated. They are then aggregated in a synthetic measure of sustainability. The calculated indicators can be used to compare the sustainability of organic and conventional farms, in addition they can also be used to visualise farm heterogeneity within the organic sector and to monitor the trajectory toward conventionalization. The first results show that, although the ongoing dynamics, Italian organic farms are on average more sustainable than conventional farms.

Constituting context

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In this paper we apply a dynamics perspective on how organic farmers incorporate the natural resource base and new consumer networks into their daily activities. Based on case study research among farmers in Galicia (Spain), we analyze how access to land is arranged, what cow breeds are used and how labour-input is organized, and more in general how endogenous development patterns increasingly are transformed into new and often stable relations with the outside world. We assess the multiple outputs related to food production and discuss the multifunctional performance of the different organic dairy and cattle farmers involved. Our case study research enlightens how the Galician cattle breeders govern progress: how they guarantee the continuity of the farm business by the production of external tradeoffs, and how their business orientation embodies a prospect for sustainable development in Galicia more in general.

Sustainable orchards' design: a participatory and iterative approach

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Apple production is among the most intensively sprayed production. Orchards' design usually targets productivity rather than autonomy and reproducibility. However, as perennial and multi-strata systems, orchards create complex design opportunities to promote natural regulation processes and to address sustainability issues. Besides there are specific expectations from the food-chain and the consumers for technical, aesthetical and nutritional qualities of fresh fruits. This pleads for an integrative approach both at agro-ecosystem and food-chain level. To combine the diversity of interpretations and knowledge required to (re)design sustainable orchards, we developed a participatory approach with fruit producers, technical advisers and agricultural scientists. It relies upon (i) expert-based knowledge to settle the objectives and properties of sustainable orchards; (ii) system prototyping of co-designed candidate models and ex-ante evaluation. After four years of group-functioning, we hereafter introduce major findings. First, the design of sustainable orchards entails to consider diversity, both among and within candidate models. Most of existing innovative and impressive experiences (e.g. association of animal and fruit productions) have been identified in organic and low-input commercial orchards. Key-elements for design purposes were discussed and included in a framework to design candidate prototypes. Second, a sustainable orchard appears as a dynamic entity adapting to global change and progressing towards 'a higher resilience'. Methodological issues for simultaneous conception-evaluation process of prototyped systems were outlined and different tools we explored. To conclude, both diversity and dynamics of orchard models are key elements to sustain productivity and reproducibility. The most promising co-designed prototypes are now to be evaluated in various contexts covering Northern to Southern contexts of Europe within a follow -up project still to initiate.

Outputs of a research, training and advising sectors network to contribute to organic farming development in France

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Organic farming is increasingly considered as a sustainable production model which can inspire agriculture. In France, this sector is dynamic and growing but, many questions are still pending. Research, training and advising sectors contribute to this development. In order to federate strengths, organize complementarities and improve the efficiency of organic farming sector, a combined technological network (RMT) called RMT DévAB standing for "Development of Organic Farming" has been created in 2007…. Through this network both the different knowledge holders and their various forms of knowledge are taken into account thus creating a federative space for dialogue. Several outputs have been designed by the partners through this network namely (i) thematic technical or economic leaflets, (ii) a comprehensive book on «organic farming and environment», and (iii) a mapping of all French running projects in organic food and farming. They will be presented and discussed during the workshop. The on-going workpackages focus on pooling training, improve the efficiency of scientific and technical production and also on how to initiate and coordinate dynamics of organic farming development with different actors at a regional level.

Design of a references framework for organic food and farming initiatives: valuing the organic diversity

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In a context of the rapid growth of the organic initiatives, the importance of a proper definition of a references framework of Organic Food and Farming (OFF) seems crucial. It has been identified that a lot of work was focused on technical aspects to produce some "technical references", or even some "technical-economical references", but that the environmental, territorial and social dimensions, essential in the OFF principles, were insufficiently taken into account. A project, called REFAB (Conception of a references framework for the OFF development) has emerged from a French network called RMT DévAB (combined network of scientists, teachers and advisers working on OFF). The objective of this design is to produce "a methodological guide" to build a joint organization of the references production on shared bases by valuing the variety of the OFF's systems and by taking into account the territorial dimension within networks and markets. This framework has to be built with at the same time i) indicators used in conventional farming to allow comparisons in particular for farmers in conversion, and ii) specific indicators of OFF for a more global approach in particular in the environmental and social domains. Indeed there is an issue on the OFF's social project. How is the quality of organic related to other qualities such as "scale of operations", "number of actors involved", "equity/inequity in the distribution of costs and benefits"? In this paper, we will focus on "shadow areas" of OFF, not well documented. This requires a re-discussion of the set of attributes of performances that should be considered when discussing of "progress" in the sustainability of food system. Our work will put the light on the difficulty to delimitate the borders defining the strict identity of OFF, as it is in perpetual evolution, with an increasing heterogeneity.

Agricultural practices and natural regulations in organic vegetable production

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Through the conventionalization thesis, many authors question evolution trends in organic farming (OF), thus advocating alternative dynamics. Ecologising OF could be an option, more crucial in intensive systems, and namely in sheltered vegetable production. Enhancing biological activity for fertility maintenance or reduction of pests incidence appears as a good opportunity for these systems. However it appears as difficult to identify or design systems fulfilling such objectives. So, a study was conducted in organic vegetable farming to understand the possible links between farmers' practices and their arguments to mobilize (or not) natural regulations (NR).

In this scope, surveys were conducted in 29 vegetable farms in the south of France. They showed an important diversity of the agricultural practices (22 variables). When considering how farmers use NR processes (7 variables), three groups could be distinguished. One group is characterized by a low reasoning of practices based on NR, except for associating species and varieties, but also by a specific weed management and an average diversity of pests. The other two groups are opposed, due to differences in the reasons for mowing inter-shelters (based on the NR) and a low number of pest species (for one group).

The analysis of the co-inertia between farming practices and reasoning NR is not significant. However, a test of independence (χ^2) shows a significant association (χ^2 = 4%) between the farmers' practices and their reasoning, based on natural regulations.

In vegetable farming systems under shelters in organic farming, it appears as difficult to understand farmers reasoning about the use of natural regulations. Conversely, reasoning practices

based on potential natural regulation doesn't mean there is a real natural regulation. It is important to complete this study to follow up the diversity and the abundance of the NR.

Regional conversion to Organic Farming in Camargue, south France. A multi-scale integrated assessment of scenarios

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The rapid growth of organic agriculture in the last decade suggests that this form of farming might become more common and its extension may cover large parts of certain regions. The regional conversion to Organic Farming (OF) might represent great advantages in terms of ecosystems integrity and local natural resources conservation.

However, is this regional conversion plausible? What could be the impact of such conversion for agricultural production and nature conservation? Taking into account the heterogeneity of farms and farming systems in a region, are there farming systems more easily convertible than others?
The objective of this paper is to show the results of different scenario analyses about the extension of OF in Camargue, South of France. The application of different modeling approaches with great potential for the multi-scale and multi-criteria evaluation scenarios is presented. These models include Bio-economic models, Agent-based models and Land use/cover change models.

According to our results, in the Camargue, the most probable conversion in the near future would take place in fields with low salt pressure belonging to livestock breeders and diversified cereal producers. However, the regional conversion to OF is plausible as the region could maintain its economic productivity while decreasing the potential harmful effect to the environment. Finally, the possible trajectories of conversion suggest that certain farmers (specialised in rice production) might need greater help to assure such conversion to OF as their economic performance is hampered during that period.

The application of these three modeling approaches to assess the same scenario in one region revealed their complementarity for exploring the issue of regional conversion to OF from different angles and at different scales.

Dynamic and more outcome-oriented approaches in regulating organic farming in the case of animal welfare

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There is a paradigm shift needed in organic standard setting towards assessing more progress than failure. Such systems need for each area (e.g. animal housing) specific principles and objectives linked to decision criteria and suitable indicators, possibly more outcome- and development-oriented. Assessment systems and Code of (best) Practices should be developed by researchers, advisers and practitioners as complementary tools for re-oriented progress certification.

An interesting case for developping such an approach is animal welfare in organic farming. Several projects and initatives have been or are under way (WelfareQuality, AssureWel/Soil Association, Bioland, TGI-Austria, etc.).

The first step is to translate ethological principles (needs) in criteria for assessment. Suitable indicators need to be detracted from the criteria, taking account of different animal groups as well as regional contexts. Examples: body condition scores (relevant for different animal categories), lameness, skin lesions and injury and prevalence of abnormal behaviour/stereotypies (e.g. feather pecking, tail biting, oral stereotypies in sows, etc.), etc.

The aim should that for each of the focus areas only a limited set of key indicators (or at least control points) are outlined, as a result of a participatory process. Once this has been introduced a simplification of some of the norms is possible.

The challenge is the transition from the old to the new approach without creating additional burdens for farmers, but to base the whole system more on self-responsibility and monitoring progress. First experiences with such an approach and recommendations are given how to implement, upscale and combine different approaches both for regulatory bodies, advisory services and standard setters.

Currently, certification examines in fine detail to check whether boundaries have been overstepped; in future it could rather determine where this farm is along the path and what can be optimised.

Exits from organic farming. Dynamics in France and processes at stake at farm level

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Most of European countries are far from the targets set by many European Governments for organic farming, and the incentives do not seem sufficient to secure the organic sector in the long run. The much-vaunted success of organic farming (OF) hides more complex dynamics with a growing turnover of organic farmers. But until now, researches as well as public policies have mostly focused on conversion to OF, and not on the maintenance in OF. Whereas the maintenance of OF seems essential to promote the organic sector. In the present study, we aim at investigating the opting-out phenomenon in France in two directions. Firstly, we study its extent since we can note a lack of such data in literature and statistics. From data provided by the Agence Bio about the number of farmers who left organic certification between 2005 and 2010, we analyze and provide an overview of movements out of OF throughout France. Then, from a case study in the Rhône-Alpes area, we explore the processes which lead farmers to quit OF certification, and identify the different meanings of deregistration in individual and farm paths regarding organic farming.

Our work show that the opting-out phenomenon is still limited in France, but highlights the growing part of early exits (before or at the end of the conversion period), questioning the evolution of the phenomenon. Then we point out that there is a diversity of decertification processes, as combinations of circumstances, farmers' and farms' "journeys" in the framework of organic farming, and what remains at farm's and farmers' level from their passage through OF certification.

The value of this approach resides in the fact that it improves the intelligibility of forms of transition by, and practising of OF, going further than approaches by motivations and consequences, enriching the debates about patterns of OF, difficulties that farmers have to maintain in OF, and difficulties of the organic sector.

Sustainability assessment of stockless organic farming system with agro-ecological and socio-economic indicators in Italy

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Is organic agriculture sustainable? For which aspects?

These research combine the agroecological with the socio-economic dimension of sustainability. It has been performed in the three years 2006/08, over 12 organic farms located in 6 regions of central and northern Italy To assess agricultural sustainability at farm level the following environmental subsystems were identified: the physical system (soil and water) and biological (flora and fauna) and

the production system (crop rotation and energy). For each of these systems different agro-ecological indicators are processed to evaluate a specific attribute of the system and its critical points. The economic indicators evaluate structural and economic performance of the farms. Agro-ecological and economic indicator were integrated into a Global Sustainability Index (GSI), able to synthesize the information contained in the multiple-derived variables, ranging from 1 to 2. The indicator values were first converted into a sustainability score applying continuous non-linear sustainability functions. Consequently, stratification was performed on three levels: unsustainable, intermediate, sustainable. Results shown that not all the farms reach satisfactory level of sustainability.

Convenors:
Giuseppe Feola, Claudia Sattler and Ali Kerem Saysel

Different types of simulation models are increasingly used in farming system research. Particularly promising are the approaches which allow for an integrated representation of system components, i.e. bio-economic or socio-ecological models. Popular techniques include linear programming, system dynamics and agent-based modelling. Against this backdrop, the workshop addresses five key themes: i) model validation; ii) the representation of the social agents; iii) integration of different modelling approaches; iv) data scarcity and uncertainty; v) the use of models in participatory processes.

A multicriteria assessment of the sustainability of cropping systems: A case study of farmers participation in the use of the MASC model

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Current changes in the field of agriculture are encouraging stakeholders to envision new and more sustainable production methods. To this end, tools are needed to assess the proposed or newly designed solutions before they are taken to the fields to be tested by researchers and/or directly implemented by farmers. MASC is a multi-criteria assessment tool designed to assess the performance of cropping systems in terms of their sustainability. It is based on a decision support system (DEXi) and aggregates 39 qualitative evaluation criteria arranged in the shape of a tree. In this paper, MASC is presented through a case study in Normandy (north-western France) where the model has been used in a participative approach with a group of farmers who have been involved in a project of pesticide reduction for several years. The model has been used to evaluate the overall performance of each farmer's cropping system. Thanks to the flexibility and simplicity of the MASC model, the farmers have participated in changing the weight allocated to each criterion in order to introduce their own vision of sustainability into parameter settings. This participative work made it possible to exchange and collectively reflect on the concept of sustainability applied at the cropping system level. At the same time, the results provided by the model were examined to identify the strengths and weaknesses of each farmer's system, and specific improvements were collectively suggested. The main limitations of this model are both the time spent to fill in all the criteria before implementing MASC and the inherent restrictions related to the given scale (cropping system).

Stimulating agricultural green growth through adaptive subsidizing based on sustainability performance

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The current EU Single Farm Payment system is criticized, as it does not create the right incentives for farmers to shift production in a more sustainable and competitive direction. The objective of the paper is to develop a conceptual framework and methodology for an adaptive subsidy system based on farms' sustainability improvements. The main difference with the current system is that the farm subsidy level is now based on the farm's sustainability score relative to other comparable farms. While the sustainability items (such as greenhouse gas emissions, water use, nitrate leaching etc) and the way the sustainability scores are calculated, are known a priori to the farmers, the strategic behavior of other farmers, i.e. to what extent they will make sustainability efforts, are unknown a priori. Various strategic

reactions of farmers to adaptive subsidizing are modeled in a game-theoretic setting with the help of agent based modeling.

In order to use sustainability as a basis for a subsidy system, it is necessary to find a transparent single index measure, which can serve as functional unit to calculate the amount of subsidies. The Sustainable Value method is particularly interesting as it is based on principles from capital theory. It applies a financial economics perspective by investigating where an investor should best invest scarce natural capital in order to create maximum sustainable value. This method seems appropriate as we want to investigate where a social investor (the public authorities) should best invest scarce subsidies in order to create maximum sustainable value.

Agent based modeling is used to simulate the emergent sustainability outcome at sector level within a region based on the heterogeneous strategic decisions of individual agents (farmers). The fact that agent based modeling allows to incorporate learning behavior, makes the technique particularly suitable for this kind of analysis.

Combining modelling approaches for participatory integrated assessment of scenarios for agricultural systems. The case of cereal production systems in Camargue, South of France

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Models are common tools used for scenario assessment of agricultural systems. In this paper we present the combined application of three modelling approaches for participatory and integrated assessment of scenarios for agricultural systems in Camargue, South of France.

By means of a land use cover and cover change model (LUCC), an agent base model (ABM), and a bio-economic model (BEM), we assessed with farmers and other stakeholders of the region scenarios related to the CAP reform and the possible extension of alternative, more environmentally friendly, farming systems in the region.

The LUCC model was used as a tool to characterize in detail, and from a retrospective point of view, the capacity for change of farming systems. Identifying and quantifying the main biophysical constraints and actual situation was used as a way to initiate the discussion with farmers and other stakeholders in the region. The use of the BEM model then helped to discuss with stakeholders and define some plausible and desired scenarios. Finally the use of the ABM model was seen as a powerful tool to organize and focus the collective discussions on possible adaptation strategies of farming systems.The combined application of the three modeling approaches is embedded in a more general framework for Participatory, Integrated, Multi-scale and Prospective Assessment of Agricultural Systems (PIMPAAS). In PIMPAS, stakeholders play a central role in the definition of scenarios and indicators for their evaluation, the co-development of models, and their use for scenario assessment.

Specific results for scenarios related to different subsidies levels for rice under the CAP reform and the reduction of pesticide use will be presented as well as the evaluation of the whole framework by local stakeholders.

Challenges in modelling policies for sustainable rural development

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The main aim of this paper is to discuss the concept of sustainable territorial development in rural contexts, and the modeling of environmental, economic and social components to allow simulation of the simultaneous dynamic impacts of different kinds of policy over time.

The paper builds on recent research (TOP-MARD) which explored the complex inter-relationships between policies, the multiple (public and private) functions of agriculture and farm households ('multifunctionality'), and the development of rural regions and the quality of life of people living there. System dynamics was appropriate in this case because of our interest in the interaction and feed back effects among economic, social and environmental systems. A model was developed in common between 11 European research partners and then adapted to the individual regions within the area of multifunctionality and sustainable rural development to analyse the impacts of different public policies. In this paper the model is applied to the Norwegian study area, Hordaland County. The study finds that reducing agricultural subsidies can lead to improvements in regional economic performance by releasing labour and capital to uses with higher returns and by creating positive feedback to the economy by improving environmental quality and overall quality of life.

Finally we will broaden these results for a general discussion on the importance of a holistic approach to the analysis of policy and indeed market impacts over time if progress is to be made towards more sustainable rural futures.

Dynamilk: a farming system model to explore a better match between forage and milk production

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Dairy systems based on grasslands are sensitive towards environmental variations (climatic events) and production constraints changes. A better match between dynamic of dairy cattle needs and herbage supply could allow the farming system to lean towards a better forage self-sufficiency at farm-scale and to be more resilient to changes.

Modeling approach enables to study several scenarios with contrasted strategies of biotechnical subsystems management in order to test different calving distributions, cattle and grasslands characteristics, or practices on pastures and meadows. A dynamic model at the farm-scale can also show the impacts of changes on the whole production systems over many years. In particular, such a dynamic model, called Dynamilk, has been created and implemented. Dynamilk is focused on relationships among dairy cattle, management and resources. This model is based on a bio-technical approach focused on grassland use by animals. Grassland sub model which consists in biodiversity characteristics and grass growth components has been developed by Jouven (2006). This paper is focused on this dairy cattle sub model's development.

Dairy cattle sub model consists in 2 units: demographic structure unit and intake, milk production and body reserve use unit. This model considers calving period and distribution, dairy cattle characteristics (ability of animals to produce milk and use its body reserve) in order to test the match between animal needs and feed supply. Milk production according to herbage and feed supply is the main output of Dynamilk. This sub model includes 3 major batches: milking cows, dry cows and replacement heifers. Validation of dairy cattle sub model has been carried out. Model behavior and sensitivity on major input parameters are assessed to be relevant according to modeling objectives. Its prediction has been compared against experimental data, Root Mean Square Deviation: 1.8 and 2.1 for indoor trials; 1.4 kg of milk for grazing trial.

Exploring multifunctionality and environmental impact of diary farming systems

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The multifunctional performance and environmental impact of dairy farming systems in Norway are studied using a model that combines ideas from mathematical programming and multi-criteria analysis. The first step is identifying variables with importance for multifunctionality. The different combinations of these variables are then examined using an algorithm that steps through the different combinations and generates a set of farming systems that are compared using multi-criteria analysis. This approach makes it possible to compare different farming systems with respect to several criteria. Examples of criteria are net farm income, labour input, N loss from soil, and ecological impacts. The ecological impacts of a farming system are quantified as an index defined as a function of disturbance and nitrogen input to the system. For pastures, disturbance is in turn defined as a function of biomass removed by grazing and grazing frequency. Sensitivity analysis is used to examine how the weight assigned to each criterion in the multi-criteria analysis affects the choice of farming system. The sensitivity analysis thus provides valuable insight into how the preferences and values of individual farmers and stakeholders influence their perception of the "optimal" farming system. The model is flexible, new aspects of multifunctionality can easily be integrated, and the model can be scaled up from the farm to the landscape or regional level.

MOLDAVI: A model to predict environmental and economical performances of broiler farming systems

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Modelling is a relevant tool to study both environmental and economical performances of livestock systems. The aim of this paper is to present MOLDAVI, a model of broiler farming systems management under animal performances, environmental and economical issues.

The system is a combination of 4 sub-models representing the animals, the poultry house, the manure and the outdoor run for free-range systems. Animal performances (growth, feed intake, mortality) are simulated in relation with birds' characteristics (growth rate), feeding (nutrient composition) and rearing environment (temperature, animal density). Concerning environmental issues, the model predicts NH3, N2O and CH4 emissions from manure and outdoor droppings as well as abiotic CO2 emissions from fossil fuel use (e.g. propane for heating). Manure characteristics are estimated using a mass balance approach between animal excretion and gaseous losses. Energy and water use from the system are also estimated. Economical performances are calculated from bio-technical results (animal performances, energy and water use) simulated by the model and economical references (€ per kg of live weight produced, price of feed) given as model inputs. In order to improve broiler farming systems performances, MOLDAVI has been developped to be sensitive to a large panel of farming practices including flock management (animal density, feeding strategies…), housing characteristics (type of ventilation, outdoor access…) and manure management (manure type…).

Simulations could help understanding complexity in broiler farming systems and stress synergical or compensation effects. As an example, the decrease of feed nitrogen content could lead to a decrease in nitrogen excretion and gaseous losses, but it could aleviate growth performances and therefore economical profit. Moreover,to take into account indirect environmental impacts associated to feed production, MOLDAVI outputs could be used in combination with Life Cycle Assessment.

Combining farm simulation with frontier efficiency analysis

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The model used, Gamede, is a "whole-farm" dynamic model composed of 6 biophysical modules and a decisional system (Vayssières et al, 2009). This simulation model gives accurate predictions for various sustainability indicators (labor, energy consumption, nitrogen leaks to the environement…) to characterize different observed or hypothetical farms. As Gamede is based on a stock-flow approach, we can monitor the farm stocks (slurry, fodders…) over time. Gamede also gives a full description of management operations of the production system. The Gamede model is randomly parameterized with the objective to cover the feasible domain of production systems by simulation. Key issues of the method are selecting variable parameters and defining lower and upper bounds to these parameters. Using observed ranges and expert knowledge are the tested hypothesis. Even though the simulation approach constitutes a relevant tool for describing the production system, it can not provide a global efficiency analysis taking into account multiple parameters. We suggest combining Gamede with a linear programming model using the "Data Envelopment Analysis" method to assess the efficiency of a large variety of simulated farms. Each farm is characterized by different structural and decisional parameters, inflows and sustainability indicators. The last two types of variables are respectively inputs and outputs of the optimization model. The DEA method implemented in this paper considers both the production flows (good outputs) and the undesirable outflows (bad outputs). The calculated frontier corresponds to the farms which minimize both pollution and inputs while optimizing their production. A distance between actual farms and the frontier is calculated to evaluate their potential efficiency progress. The main advantage of combining simulation and optimization method is that it supplies large data sets and describes accurately the parameters correlated to the efficiency.

RECORD: an open platform to build, evaluate and simulate integrated models of farming and agro-ecosystems

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The rapid change in the agricultural industry requires the development of new methods of production to guarantee sustainable agriculture. In silico approaches offer the possibility to identify more quickly new systems to tackle current social, political and environmental concerns. Numerous agrosystem functioning models already exist. Nowadays the main issue is more to couple and use them at different spatial and temporal scales rather than developing new ones.

INRA set up an integrated modelling framework to gather, link and provide models and companions tools to answer new society questions regarding agriculture. Functional specifications were drawn during a two-day meeting in January 2007. Requirements are: to develop new models as modular components, to re-use and combine them to represent cropping and farming systems at different time and spatial integration steps; to allow the modelling and simulation of farmer's decision making process; to link with statistical packages to perform model calibration or in silico experiment analyses; with economics and optimization software and risk analysis; with databases and GIS; to include random weather generators to work on climate change and uncertainty.

After different tests, the RECORD platform was built under the VLE environment, allowing the design of atomic and coupled models. It integrates different time steps and spatial scales and proposes standard formalisms to model agro-ecosystems (e.g. difference equations, differential equations, state charts). A graphic user-interface was designed to simplify coding tasks.

A variety of research projects already use RECORD. Examples are given showing the ability to recode simple models, encapsulate more complex ones, link with GIS and databases, and use the R

statistical package to run models and analyse simulation outputs. The use of web interfaces enables application by non-scientist end-users.

Participation begets integration: lessons learned from incorporating ethnography into linear programming

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Over the last decade, Ethnographic Linear Programming (ELP) emerged as an innovative method to explore farmer responses to varied livelihood system "disruptions," such as new technology, market interventions, and shocks. Modelers develop and use scenario-driven models that integrate social, ecological, and economic considerations of farm-based livelihood systems and strategies. ELP models have been developed for diverse livelihood systems across a broad geographic range. We analyzed three recent ELP modeling experiences to better understand and articulate the inherent strengths and limitations of the method. The three models reflected specific farming systems and addressed, respectively, the effect of HIV/AIDS on food security in western Kenya, commercial feasibility of a locally gathered palm in central Mexico, and potential adoption of ecologically based alternatives to chemical pesticides in highland Peru.

ELP differs from linear programming in its use of ethnographic methods to capture, quantify, and integrate qualitative social considerations into biological and/or economic models. The greatest strength of the method was the use of participatory, ethnographic methods. Community participation has intrinsic value but also greatly enhances representation of diverse social agents and facilitates integration of social, economic, ecological, and political systems in the model, all of which enhance model validity. In addition, the modeling process was flexible and amenable to the modeler's creativity. Conversely, participation increased time investments – in data collection and processing, model elaboration, and validation. Emphasis on intra-system rather than inter-system diversity limited broader application of the models. However, we recognize that the needs of academic researchers differ from those of field practitioners and expect that the latter could minimize observed limitations without substantial sacrifice to the numerous benefits outlined above.

Addendum
Book of Abstract

WS 1.3

Use of relevant economical indicators for the evaluation of farming systems in terms of resilience, vulnerability and sustainability: the case of the Lake Alaotra region in Madagascar

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The WAW initiative (World Agricultures Watch) intends to elaborate a worldwide observatory collecting information on agriculture in different countries and its evolution. Madagascar has been chosen as one of the pilot countries. The geographical area of the study which has been chosen is the lake Alaotra. The study of the notions of vulnerability, resilience, durability and viability has been the main point concerning the choice, the calculation and the analysis of the necessary indicators leading to the elaboration of the observatory. Three different data lines have been chosen: i) The database from the ROR, with annual data from 2005 to 2008 for 500 households ii) The database from the agricultural diagnosis BV-Lac in 2007 (110 farms) and iii) The database from RFR, with 48 farms in 2009 . This paper presents some results with farming systems modeling using the two databases from the BV-lac development project showing the indicators used through the example of a technical change with adoption of conservation agriculture.

WS 2.3

Unraveling innovation platforms – Insights from co-evolution of innovation in a smallholder dairy development program in Kenya

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Challenges facing agricultural development, particularly in developing countries dominated by smallholder farming are increasingly framed in the context of weak innovation systems and capacities in the growing literature on agricultural innovation systems. Innovation systems (IS) approaches emphasize the collective dimension of innovation pointing to the need to effect necessary linkages and interaction among multiple actors. IS thinking also pays attention to the co-evolution of innovation processes, arguing that successful innovation results from alignment of technical, social, institutional and organizational dimensions. These insights are increasingly informing interventions that focus on supporting multi-stakeholder arrangements such as innovation platforms as mechanisms for enhancing agriculture innovation. While much emphasis in analyzing agricultural innovation systems has focused on how these multi-stakeholder platforms are organized and mechanisms through which actors interact, there has been limited analysis that has unraveled how and why such platforms contribute to innovation processes and thus they remain a black-box. This paper therefore aims to address this gap by analyzing innovation platforms as intermediaries in efforts to better understand their contribution in shaping dynamic innovation processes. The paper presents an empirical case study of the East African Dairy (EADD) program in Kenya. The program is led by a consortium of five organizations and provides a platform for building partnerships between farmers, various government and private sector

actors to enhance innovation for improving productivity and market access for smallholder dairy farmers. The results show the diverse role of the platform as the innovation process unfolds and draws conclusion relevant to how the concept of platforms is usually approached and calls for a more dynamic view in analyzing them as part of understanding innovation processes.

WS 5.1

Combining large scale and small scale analysis to characterize the Vulnerability of Territories for small ruminant farming systems in the PACA region of France: concepts and reality

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Sheep and Goat farming systems of the PACA region of France are facing relatively severe threats given the various changes the region is facing (urbanization, change of nature of the agricultural land, market uncertainty..) . Given their system's high reliance to the use of land for feeding animals, be it by direct use of grazing land (alpine meadows etc..) or through cropping cereals for feeding animals, any change in land use or land cover and land-related policy measures expose farmers to drastic challenges.

The paper analyses the vulnerability of small ruminant farmers to land-related changes occurring in the PACA region using the DPSIR framework (driver pressure state impact response). The paper firstly studies the land cover changes at regional level that occurred from 1999 to 2006 overlaid on a partition of the region by Geo Terroirs. Secondly it focuses on one small region in the Haut Var to study at a larger scale the changes (ecological dimension and farming systems) and how farmers use the different spatial entities at their disposal to feed their animal therefore designing a complex adaptation response. It raises question on the co-evolution of farming systems and the land they use, the importance of flexible mobility and land access policies to tackle uncertainty.

GIS Data used for the regional analysis originated from a pool of catalogued layers from the CRIGE PACA and from various data providers. We used the Corine Land Cover layer with 44 categories of land cover to study changes occurring during the time frame. Categories of changes were scrutinized to extract and assess only those that may have a direct impact on livestock farming. Data used for the large scale analysis at local level originated from field surveys using the agrarian survey methods.

By combining results from large scale and small scale analysis the paper shows the importance of macro and micro adaptations for farmers to adapt to global changes.

Why and how to analyze the potential of mixed crop-livestock farming systems for sustainable agricultural and rural development at the landscape level?

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Mixed crop-livestock farming systems (MCLFSs) have been declining in France despite the special value they are granted for the sustainable development of both agriculture and the rural areas. We assume that to promote MCLFSs, we have i/ to understand long-term changes by looking at past rural development and ii/ to assess their potential using an integrated framework to evaluate their role in landscape functions. Therefore we relied on interdisciplinary case studies on agriculture and environment in contrasted French regions to build a multiscale and spatially-explicit conceptual model

of the relationships between agricultural land-use and landscape functions from the parcel to the landscape level. The processes of change in these relationships are regarded as embedded in a double hierarchy of organisation and dynamics, i.e. local agriculture and its restructuring process on the one hand, local landscape mosaïcs and ecological dynamics on the other hand. The parcel is the common entity between the two hierarchies which allows to study the multiscale interactions between ecosystem services and agricultural practices. At upper levels parcel management is encapsulated into decision-making strategies of farmers (agricultural viewpoint) and into society-driven ecosystem and landscape management regulations and incentives (ecological viewpoint). The case-study results point out i/ the major role of grasslands and crop spatial allocation for providing ecosystem services at the landscape level and ii/ common trends of change in farm management across case-study areas : an objective to secure forage ressources (to cope with draught periods), an interest in the services that livestock farming can provide to crop production and increased exchanges between farms. We conclude that a conjunct of innovative MCLFS testing and participatory research with the actors of rural territories can support progress towards multifunctional land use.

WS 6.3

What brings an adapted ESR-based integrated approach of the farm to support conversion to organic farming?

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Concerned by the impacts of agriculture on the environment, an increasing number of farms move to organic agriculture. This change in their evolution is more or less easy to manage, depending on their biophysical and economic context but also on their specific dynamics. In fact, some observers are worried about the survival of farms which convert without being sufficiently prepared, especially as the knowledge and tools needed to monitor such a change are not all operational. Numerous studies have been made on the multiple dimensions of the process of change occurring during the conversion, but few analyzed it with an integrated approach. Based on the adapted ESR framework (Hill and MacRae, 1995), we present in this article the preliminary results of a multi-scale integrated analysis of the changes occurring during the conversion to organic farming and highlight the diversity of these changes.

WS 6.4

Modeling impact of Conservation Agriculture adoption on farming systems agricultural incomes. The case of lake Alaotra Region, Madagascar

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Conservation Agriculture (CA) was introduced at the lake Alaotra, in Madagascar, in the 2000's in a context of traditionnal mining upland agriculture and silting-up of lowlands rice fields. Land tenure pressure linked to the attractiveness of the area leads to the progressive colonization of surrounding upland hills, very sensitive to erosion. Conservation agriculture tackle with a double challenges: i) maintain and/or increase household income and ii) preserve natural resources trough sustainable agricultural practices in the long term.

This paper assesses the economic impact of CA adoption on farmers's income trough modelling representative farms selected according to a local typology based on the last 5 years with a prospective analysis for the next 5 yers. The Project Field Database highlighted a light increase of yield according to the age of CA systems. A buffering effect on climate hazards has been as well identified trough production stability over the years leading to adoption as part of a risk limiting strategy. Elements of the CA techniques are adopted spontaneously within surrounding farming systems leading to improvment of conventionnal tillage based systems. Smallholder's agricultutural practices evolution displays a high capacity for innovation.

Modeling with a dedidated tool (budget analysis oriented with a step by step approach) has highlighted that CA systems improve significantly net farm income at plot scale in the midterm (5 to 10 years). For farm holdings with few irrigated rice fields, mainly relying on upland agriculture, CA systems increase farming systems resilience to climatic events and price volatility as well as sustainable agricultural practices maintaining local and fragile ressources.